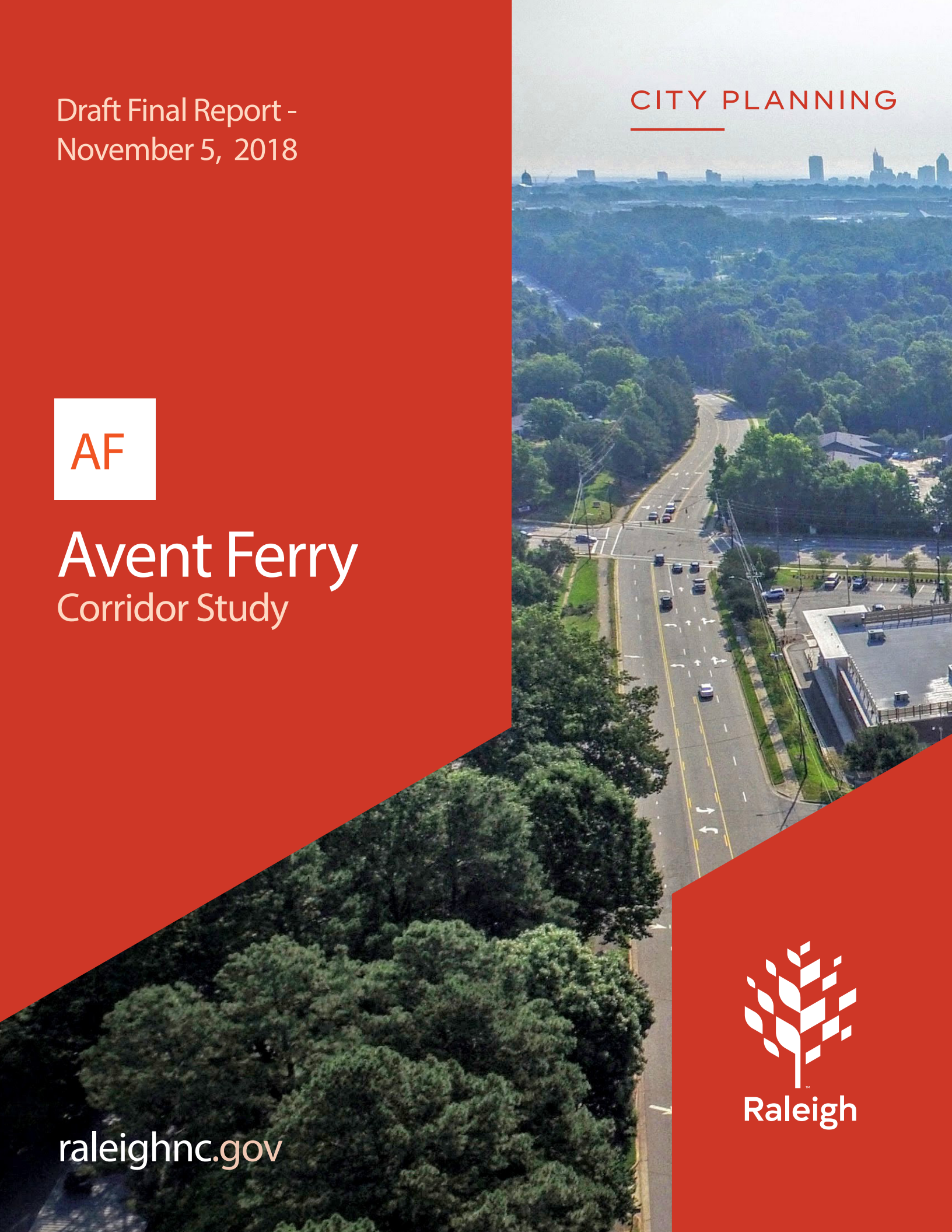
Draft Final Report -
November 5, 2018

CITY PLANNING

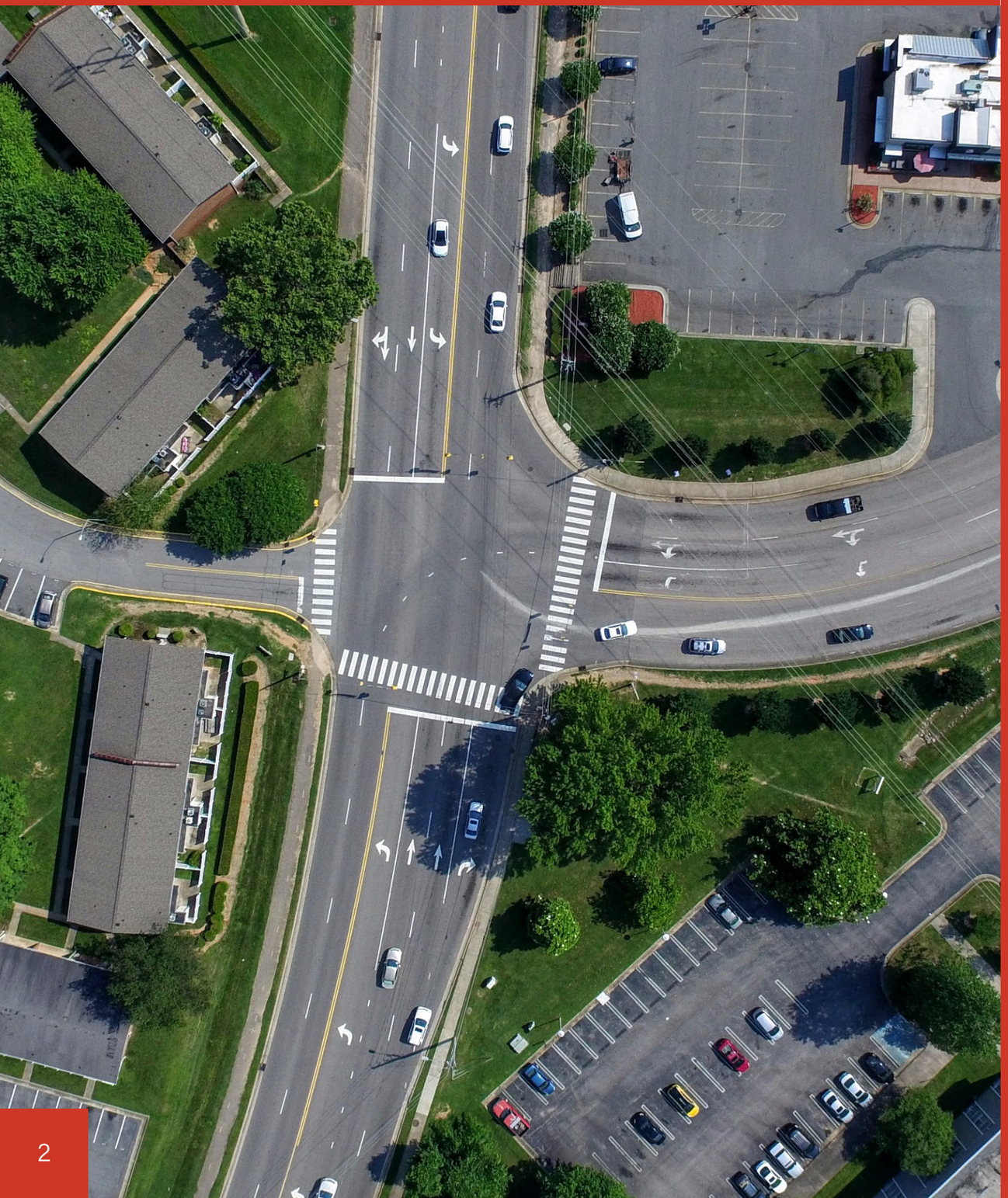
AF

Avent Ferry
Corridor Study



Raleigh

raleighnc.gov



DESIGN CONCEPTS

Thanks to public input, a list of goals for the corridor was created. These goals can be sorted into three categories that became the concepts we used to craft feasible policy recommendations.

Overal Goals for the Avent Ferry Corridor Study

- Enhance economic vitality and livability
- Promote ease-of-access and movement with complete streets design
- Leverage public infrastructure to better secure long-term corridor stability
- Identify market opportunities for redevelopment
- Retain and expand commercial services as a high priority
- Celebrate and highlight the area's economic and ethnic diversity
- Develop a mix of residential types to attract and retain residents
- Create walkable, mixed-use development at key nodes
- Strengthen overall connectivity within and to surrounding areas
- Improve the safety and aesthetic appeal of the corridor
- Provide feasible implementation items

Design Concepts

1. Develop a distinct district with a unified identity compatible with the existing character of each corridor segment

2. Adapt a complete streets concept to safely and efficiently accommodate pedestrians, cyclists, transit users, and motorists.

3. Foster development that activates area growth with respect to the varying character of each corridor segment.

1 Develop a Distinct District

Conversations throughout the course of this study have been motivated by an underlying desire to leverage the energy of a diverse population, outstanding recreational assets, and a high-tech research campus to transform the corridor area into a creative community that encourages new investment and attracts new residents. The corridor should be characterized by a modern and efficient transportation network, vibrant mixed-use centers, and well-connected greenway system. New development should expand upon these existing assets and provide quality housing opportunities for residents of all economic levels. More diverse retail opportunities should cater to locally and nationally operated retailers alike. Residential and office densities should increase to provide a steady economic base to support these commercial activities and multimodal transit options should safely and conveniently connect these uses. New construction should be appropriately scaled, creating nodes of higher density at Mission Valley and Avent Ferry Shopping Centers, and protecting the stable residential atmosphere in the balance of the corridor. The Corridor should implement contemporary understanding of natural systems including water, vegetation, and fauna through a continual ribbon of greenery through vegetated medians, street trees, and green infrastructure.

Targeted Site Themes

The character of the Avent Ferry corridor changes from urban commercial to suburban residential. Three targeted catalyst areas were identified to build place-based strategies for economic development to support current and future land uses. The target areas are geographically bookended by the destination-oriented center at Mission Valley, focused on employment, dining and entertainment; and the Lake Johnson area, focused on recreation and housing. The central target location at Avent Ferry Shopping Center continues to serve the corridor residents and the surrounding area with a convenience-oriented center focused around a grocery anchor.

Distinct District Strategies:

- Leverage infrastructure improvements to attract new private investments and new residents
- Adapt complete streets principles to safely and efficiently accommodate people in cars, on transit, on bicycles, and on foot
- Foster development within a unified district that activates area growth and inclusive vitality with respect to varying character of each corridor segment
- Develop vibrant nodes of high density mixed-use centers at Mission Valley and Avent Ferry Shopping Centers, and protect stable residential neighborhoods along the Corridor
- Provide a well-connected greenway system
- Capitalize on existing assets and provide quality housing opportunities for residents of all economic levels
- Cater diverse retail opportunities to locally and nationally operated businesses alike
- Provide a steady economic base to support commercial activities with increased residential and office densities
- Scale new construction appropriate to its context
- Implement interconnected water, vegetation, and fauna of natural systems through a continual ribbon of greenery through vegetated medians, street trees, and green infrastructure

2 Adapt Complete Streets Corridor

Multi Modal Access

Transportation design and planning for most of Avent Ferry Road's history has been focused on the safe movement of cars and trucks. As community values and needs have shifted over the past 15 years, new best practices are now important to better accommodate bicyclists, pedestrians, and transit riders. As documented by the public engagement efforts of this study, demand for transportation services has evolved to include quality transit, bicycle facilities, and more walkable communities. The concept of "Complete Streets" has emerged as a comprehensive strategy to address public demand for multi-modal transit choices. Complete Streets are principles that provide an efficient multi-modal transportation network so the accessibility, mobility, and safety needs of motorists, transit users, bicyclists and pedestrians of all ages and abilities are safely accommodated. The NCDOT has established extensive policies and guidelines for implementing complete streets. The report recommendations apply the guidelines to streets within the Avent Ferry Corridor by supporting protected sidewalks, bike lanes, safe crossings, quality transit stop amenities, and green infrastructure elements.

A major multi-modal opportunity planned for the corridor is the proposed Bus Rapid Transit line along Western Boulevard. This line will provide high-frequency bus travel options connecting the corridor to downtown Raleigh, NCSU, and west Raleigh. Future high intensity development around these transit stops should cater to transit ridership. Specific development strategies to achieve this goal are described later in this report.

Complete Streets Strategies:

- Transform Avent Ferry Corridor into a Complete Street designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities
- Improve key intersections along Avent Ferry to address bike/pedestrian safety, access and crossings
- Provide safe and secure pedestrian and bicycle crossing across Western Boulevard (NCDOT underpass) to connect to both sides of the Avent Ferry corridor
- Enhance bicycle and pedestrian safety with grade-separated bicycle lanes, separated sidewalks, and isolated bicycle and vehicular lanes at busy intersections
- Improve and augment pedestrian connections between neighborhoods, University, Lake Johnson, and shopping centers
- Provide for higher density development near future BRT transit stops
- Improve bus stop amenities to encourage transit use
- Enhance connections to the greenway system

An example of a major street thoroughfare designed as a complete street.
Photo credit: Urban Street Design Guide, National Association of City Transportation Officials

3 Foster Redevelopment and Economic Viability

Market Analysis

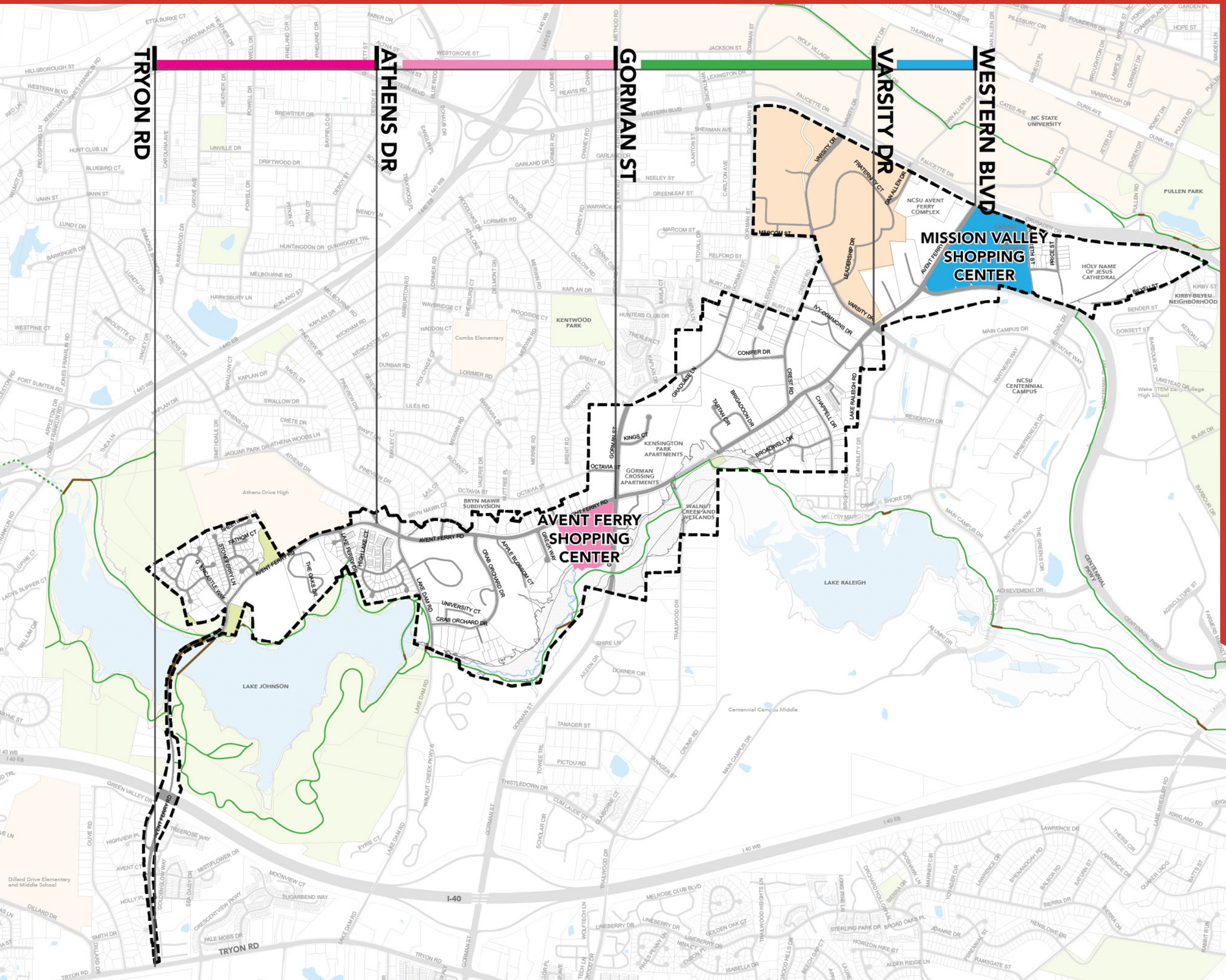
The comprehensive market analysis suggests the following principles should drive the economic development strategy for the corridor.

Redevelopment and Economic Viability Strategies:

- Improve the safety and aesthetic appeal of the corridor to reflect the community's commitment to the corridor and to attract private investment.
- Formulate strategies to attract and retain older generations and established residents.
- Make shopping, dining, entertainment, and employment opportunities high priorities to sup¬port expanded housing lifestyle options.
- Promote ease-of-access and movement, as well as attractive place-making to improve and enhance the resident and visitor experience.
- Leverage public infrastructure improvements as a catalyst for private investment to provide additional lifestyle options and experiences and help "sell" the corridor. This would attract new investment, provide jobs and economic mobility for the community, as well as an increased tax base.
- Develop collaborative partnerships and include the Raleigh Area Development Authority, NCSU Centennial Campus, Wake County and Raleigh Economic Development, and the Greater Raleigh Chamber of Commerce to provide marketing assistance and create a recognizable brand for the corridor.
- Highlight and celebrate the area's diversity through partnerships

Entrance to the Avent Ferry Shopping Center with larger tenants listed
Photo credit: Weingarten Realty

Street sign at in NC State University's Centennial Campus
Photo credit: visitraleigh.com



DESIGN RECOMMENDATIONS

Based on extensive analysis, public review, and consultation with design and planning experts, the following recommendations are proposed. This chapter breaks up recommendations into the following:

COMPLETE STREETS RECOMMENDATIONS
- TRANSPORTATION
- STREETSCAPE
- BICYCLE AND PEDESTRIAN

FOCUS AREA RECOMMENDATIONS

LAND USE & DEVELOPMENT RECOMMENDATIONS

STORMWATER MANAGEMENT RECOMMENDATIONS

DESIGN DETAIL RECOMMENDATIONS

Complete Streets Recommendations

Transportation

The Avent Ferry Road corridor currently serves two types of traffic movements; (1) commuters connecting through the corridor and (2) local traffic moving to destinations within the corridor. Finding a balance between serving local uses, such as residential, retail and intercampus trips, as well as serving the needs of daily commuters, is challenging. In addition to vehicular traffic, many local trips within the corridor utilize transit services or bicycle and pedestrian facilities.

This corridor study employs a "Complete Streets" approach to present transportation improvements to better accommodate local multimodal travel and support current and future land uses. The recommended transportation infrastructure improvements are designed to accommodate the changing land use and density as the corridor redevelops. The recommended roadway configurations, with enhanced bicycle and pedestrian facilities, would facilitate a higher quality of active transportation access to destinations within and adjacent to the corridor. The proposed improvements will also facilitate automobile trips that originate or terminate within or adjacent to the corridor, including single- and multi-family residential, Mission Valley Shopping Center, Avent Ferry Shopping Center, NCSU Main and Centennial Campuses, and the Catholic Diocese of Raleigh.

The proposed roadway configuration will calm traffic and create a safer environment for all transportation modes while still meeting acceptable levels of service (LOS) standards, LOS E, set by the City of Raleigh. Protected, elevated bicycle lanes are proposed in both directions along the entire corridor. The corridor has a higher bicycle usage than most collector roads in Raleigh, used predominately by students commuting to the NCSU campuses. Dedicated bicycle facilities protected from automobile traffic will be significantly safer for cyclists utilizing the corridor. Providing a safe means of transportation for all modes is the goal of the complete streets design principles.

An example of a bike lane and bus stop operating in tandem on a street in Seattle, WA
Image source: pedbikeimages.org, SDOT

Consolidating Transit Resources

Locations where GoRaleigh and Wolfline stops are separated by a few hundred feet but have different stop locations and amenities provide an opportunity for GoRaleigh and Wolfline to coordinate stops and allow Wolfline riders the use of existing GoRaleigh transit facilities.

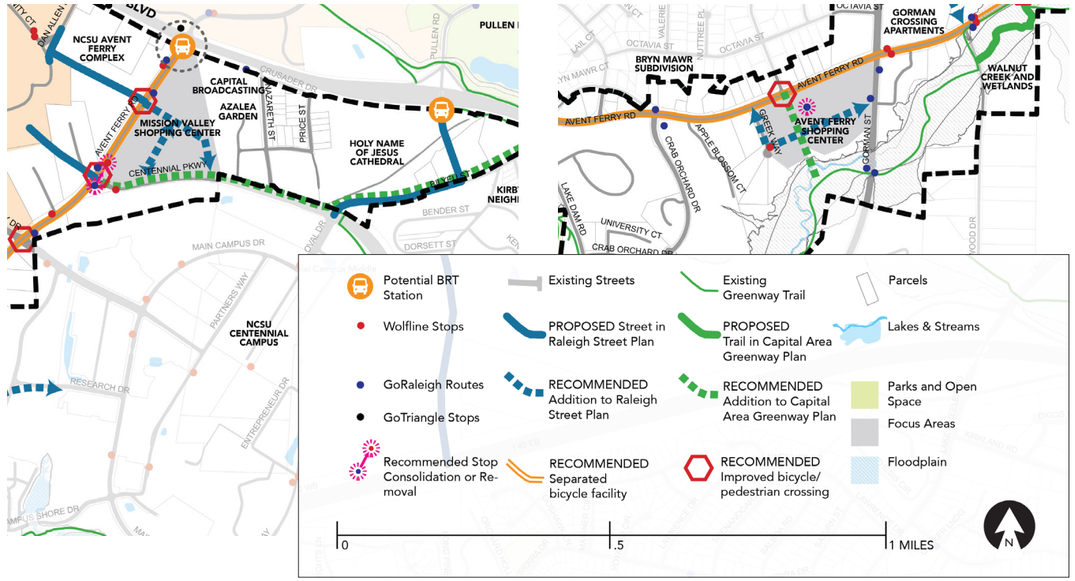
The first location is at the Avent Ferry Road and Centennial Parkway intersection; the GoRaleigh stop, located south of the intersection, has a bus shelter and bench while the Wolfline stop, located north of the intersection, has no amenities. The second stop location is along the Avent Ferry Shopping Center frontage. The GoRaleigh stop has a shelter and multiple benches while the Wolfline stop, located west of the Avent Ferry Shopping Center along Greek Way, has no amenities. In addition to providing more amenities for Wolfline riders, this approach would streamline bus stops, reduce confusion, and create a more predictable traffic pattern near bus stops.

The Wolfline will restructure two routes from Avent Ferry Road to Pullen Road once the City of Raleigh completes the Pullen Road Extension to Centennial Parkway in late 2018. These bus lines will continue to service areas between the NCSU Main Campus and Centennial Campus. These two routes will bypass Avent Ferry Road and use Pullen Road Extension as the main thoroughfare to connect NCSU Main and Centennial Campuses.

Transit Considerations

Although dedicated transit lanes were not included in the final corridor recommendations, the project team considered dedicated transit lanes and shared transit and bicycles lanes between Western Boulevard and Varsity Drive and between Varsity Drive and Gorman Street along Avent Ferry Road. Ultimately, configurations with dedicated transit lanes require trade-offs between increasing vehicle congestion and delay along those segments or eliminating dedicated bicycle facilities.

An alternative was developed to assess a configuration with a single, northbound dedicated transit lane between Western Boulevard and Varsity Drive. This limited dedicated transit lane would require a shared transit and bicycles



An example of BRT infrastructure that may be incorporated at Mission Valley Shopping Center and Western Blvd.
Image source: Wake County Transit Plan

lane, due to the limited right-of-way. Having dedicated bicycle infrastructure was prioritized for the corridor and the right-of-way could not accommodate both dedicated bicycle infrastructure and dedicated transit lanes along most segments of Avent Ferry Road. As such, dedicated transit lanes and shared transit and bicycle lanes were not included in the final recommendations.

Potential Centennial Parkway Realignment

In response to stakeholder input, the impact of a potential realignment of Centennial Parkway to traffic at the Avent Ferry Road and the Centennial Parkway intersection was analyzed. A series of design assumptions were used to test the LOS and intersection movements and delays based on the basic realignment concepts developed through stakeholder input.

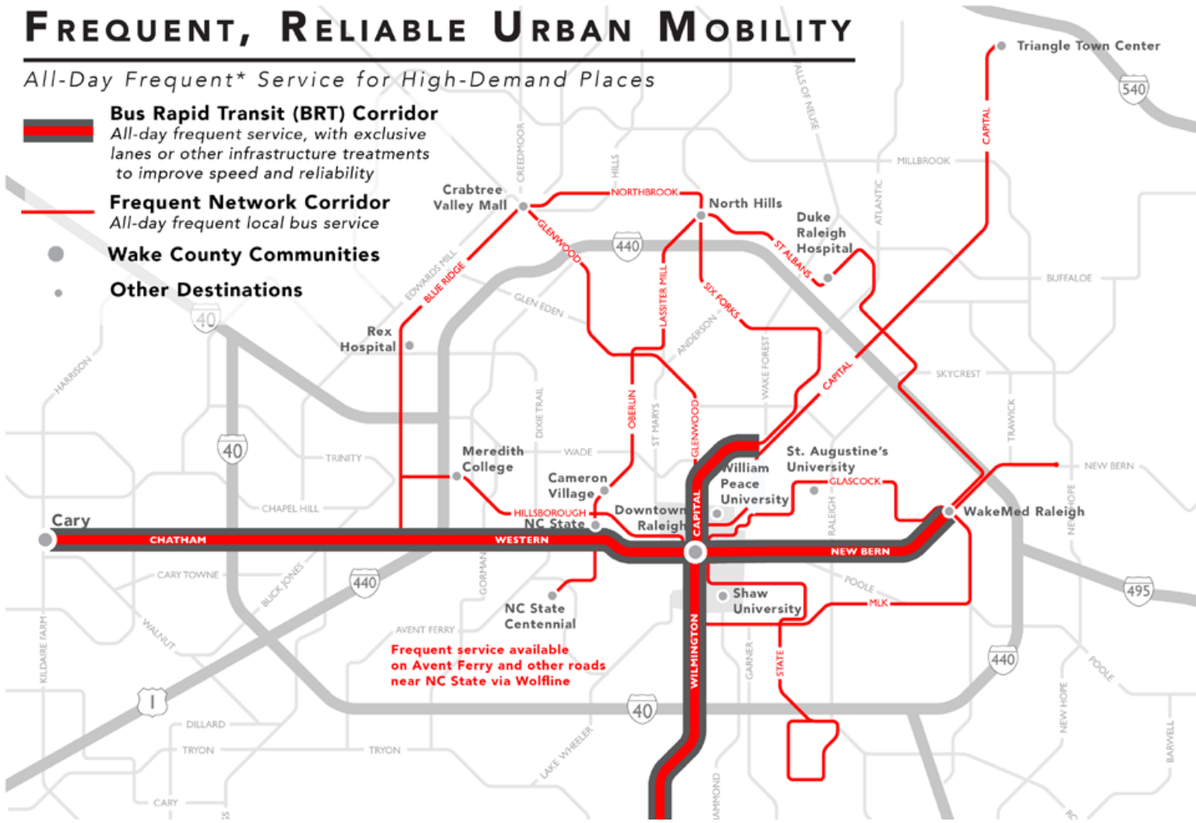


Image source: Wake County Transit Plan

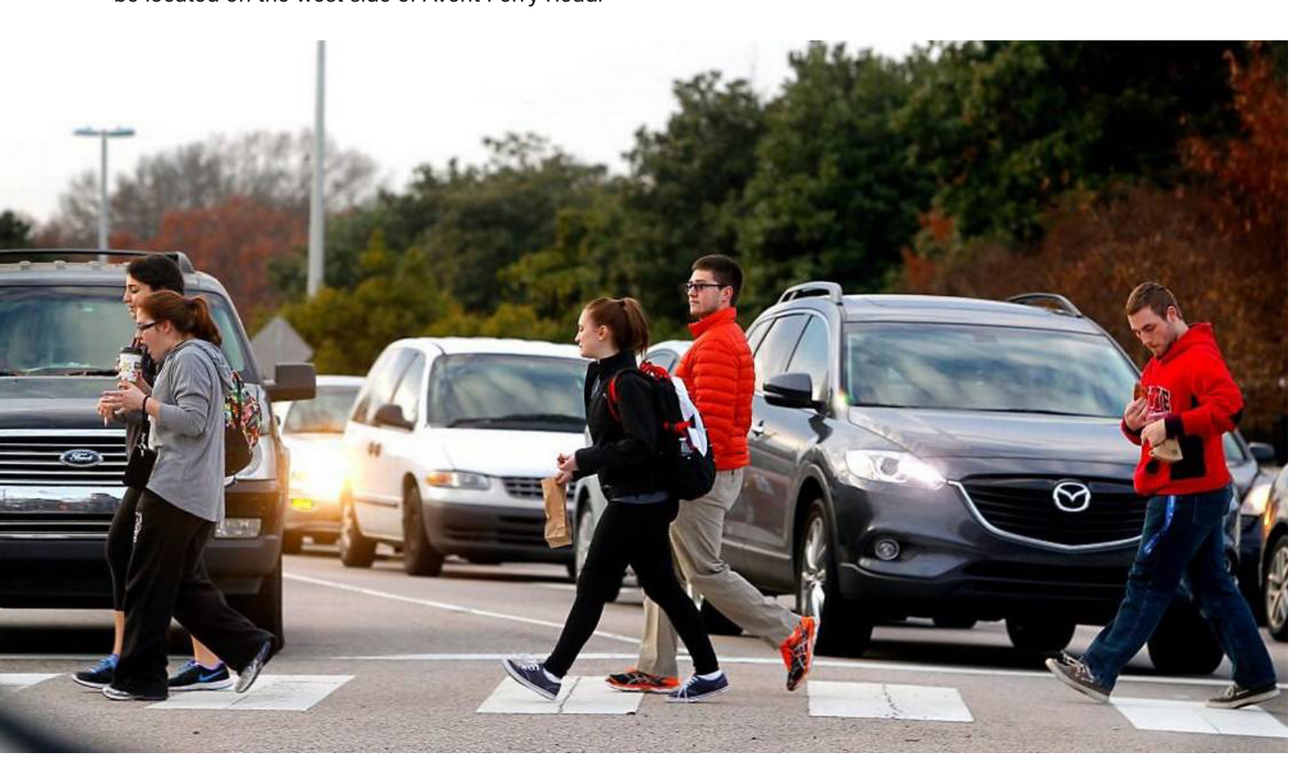
Alignment with Wake County and NCDOT Transportation Plans

Future implementation of the 2016 Wake County Transit Plan includes a BRT line along Western Boulevard with a proposed station close to the Western Boulevard and Avent Ferry Road intersection. The BRT improves bus speed, frequency, and reliability by adding dedicated transit lanes, transit signal prioritization, level-boarding platforms, and off-vehicle fare payment. Providing first-/last-mile multi-modal connectivity from Avent Ferry Road to the Western Boulevard BRT station is key to increasing transit ridership in the corridor. Currently, the BRT station, access to Mission Valley Shopping Center, and a planned pedestrian underpass between NCSU Main Campus and Avent Ferry student housing (discussed below) is being considered in isolation. However, the success of each of these improvements will be far greater if they are considered as part of an overall solution to pedestrian, bicycle, and vehicular movements at the intersection. Efforts should be made to link the four corners of the intersection and the BRT station via the proposed underpass. The current underpass concept should be re-envisioned with this as the driving design priority. Additional construction funds should be allocated as necessary.

NCDOT is planning a bicycle/pedestrian underpass below Western Boulevard at the intersection with Avent Ferry Road. This tunnel will enhance connections between the North Carolina State University (NCSU) Main Campus, Mission Valley Shopping Center, and Centennial Campus. However, current concept designs for the underpass indicate the tunnel entrance will be located on the west side of Avent Ferry Road. While this will improve safety for those crossing Western Boulevard, the proposal does not address the safety for pedestrians and cyclists crossing Avent Ferry Road between Mission Valley Shopping Center and Avent Ferry student housing, nor does it provide safe connection to the proposed BRT station east of the Western Boulevard/Avent Ferry Road intersection. Further complicating this approach, a "west-side-only" underpass entrance requires two-way cycle lanes be located on the west side of Avent Ferry Road.

The two-way cycle lanes are undesirable because it presents safety issues with two-directional bicycle traffic on a steep grade and requires an additional crossing to move northbound cyclists to the west side of the street.

Given the expected redevelopment of Mission Valley into a large mixed-use community, the final underpass design should accommodate the substantial increase in bicycle and pedestrian traffic to and from the shopping center. Therefore, it is highly recommended the tunnel provide grade-separated access to both sides of Avent Ferry Road. This solution should be evaluated during the underpass design process.



Pedestrians crossing Western Boulevard at Avent Ferry Road near NC State University
Image source: newsobserver.com, file photo

Streetscape Recommendations

The corridor was divided into four segments along Avent Ferry Road to develop alternative roadway configurations:

1. Western Boulevard to Varsity Drive
2. Varsity Drive to Gorman Street
3. Gorman Street to Athens Drive
4. Athens Drive to Tryon Road

A series of alternatives were created and refined to study each segment. Typical street sections were created, utilizing existing right-of-way to provide a planning-level design including roadways, transit and bicycle and pedestrian facilities. The alternatives were analyzed using existing traffic conditions to assess the corridor LOS and queuing delays at intersections.

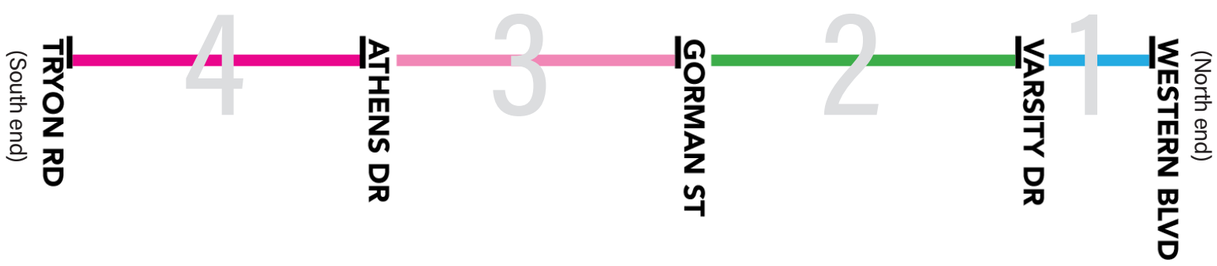
There are a few noteworthy features that apply to all four segment lane configurations. The proposed dedicated bicycle lanes would be buffered from vehicular traffic, allowing a continuous path along Avent Ferry Road between Western Boulevard and Tryon Road. Some elements of the roadway design, such as lane widths and the median width, are narrower than City of Raleigh roadway design standards; however, the proposed streetscape details are recommended for adoption as a streetscape plan. Improvements outside of private redevelopment should be budgeted as CIP items for implementation. Please see the implementation table in the final chapter for more detailed information.

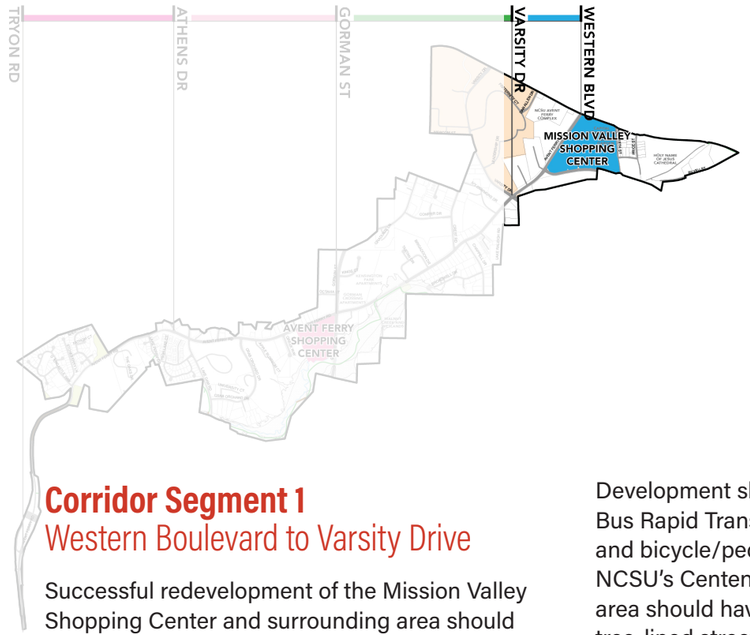
Assessment Criteria

Initially, each segment had two to three potential alternatives. The alternatives were created based on character of the street segment and public comments from the October 2017 Avent Ferry Public Design Workshops. While the alternatives drew heavily from public feedback, the typical sections were refined to fit within the existing right-of-way and meet engineering and safety standards. The alternatives were assessed on the following criteria:

- Vehicular Traffic Level of Service: Would the proposed typical section meet the acceptable LOS for the City of Raleigh? Which alternative would provide the best level of service during the AM and PM peak hours?
- Accommodating Bicycle and Pedestrian Facilities: Which typical sections would provide safe and efficient bicycle and pedestrian mobility?
- Fitting with Character of the Corridor, the Complete Street Approach, and Future Redevelopment Opportunities: Would the typical section create a vibrant place with transit and active transportation options? Would it serve the local traffic along the corridor? Would it facilitate future planned or proposed redevelopment along the corridor?

As alternatives were analyzed, each were refined and new lane configurations tested to establish a typical section to better meet each of the above criteria.





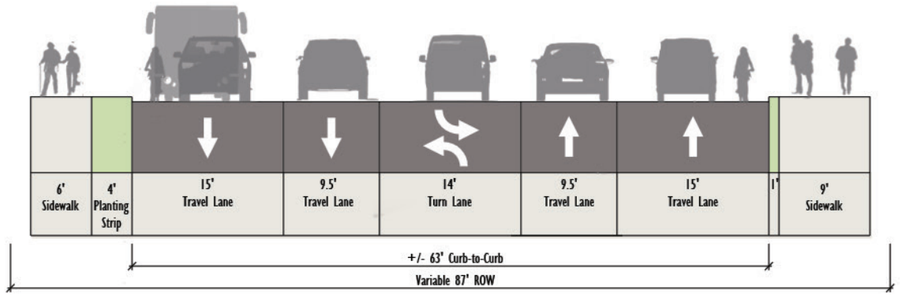
Corridor Segment 1
Western Boulevard to Varsity Drive

Successful redevelopment of the Mission Valley Shopping Center and surrounding area should serve as a catalyst for further investment in the corridor. The highest residential density and highest allowable building height in the corridor should be developed here. Height should taper to the rear of the site away from Avent Ferry Road.

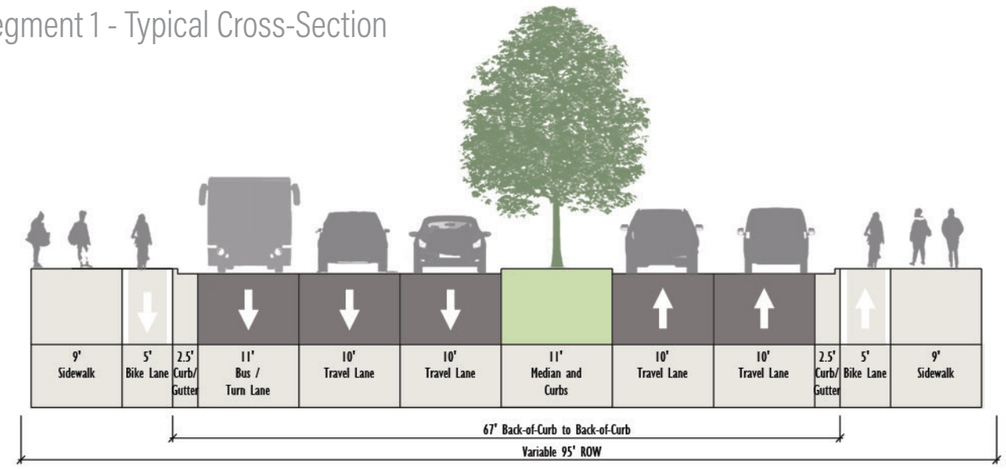
Development should capitalize on the proposed Bus Rapid Transit line on Western Boulevard and bicycle/pedestrian traffic moving between NCSU's Centennial and Main Campuses. This area should have a distinctly urban feel with tree-lined streets flanked by a variety of retail establishments on the ground level. Parking should primarily be structured and screened from street view.

Looking north on Avent Ferry towards Mission Valley and Western Blvd.

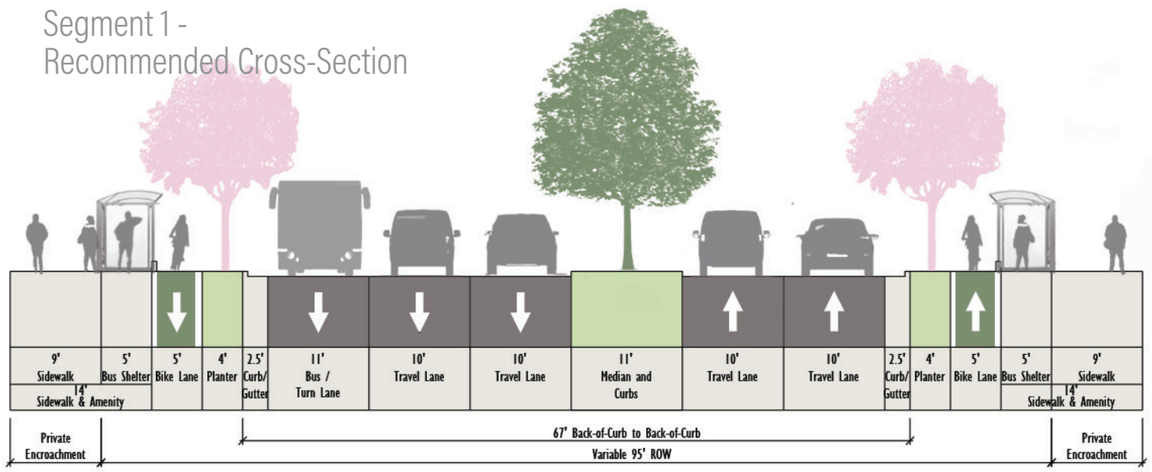
Segment 1 - Existing Conditions

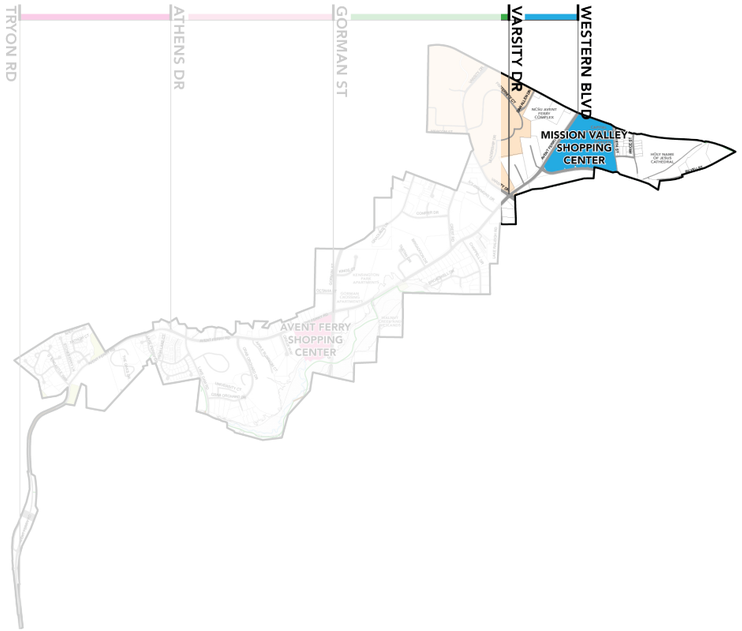


Segment 1 - Typical Cross-Section

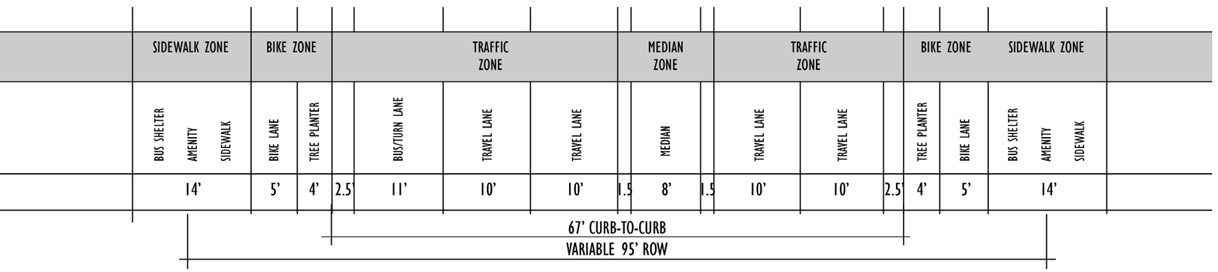


Segment 1 -
Recommended Cross-Section

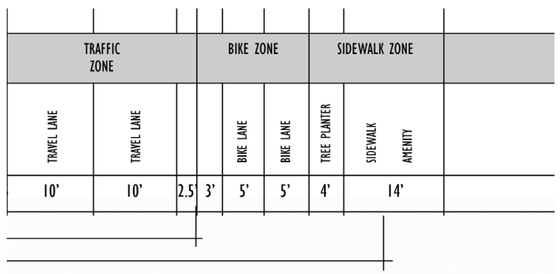




Segment 1 - Option A



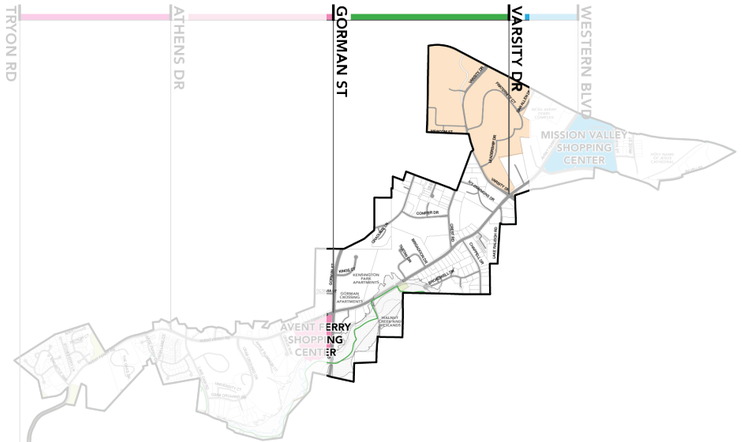
Segment 1 - Option B



Segment 1 - Recommended Cross Section - Western Blvd to Varsity Drive

The recommended design for this segment is two 10' northbound vehicle travel lanes, one northbound 11' que jump/turn lane, two 10' southbound vehicle travel lanes, an 11' center planting strip/median, 5' raised and buffered bicycle lanes on both sides of the street and 14' sidewalks on both sides of the street.

If the proposed grade-separated pedestrian crossing at Western Boulevard is constructed on only one side of Avent Ferry, a two-way bicycle track is recommended for that side of the road to provide safe access for people on bicycles (option B).



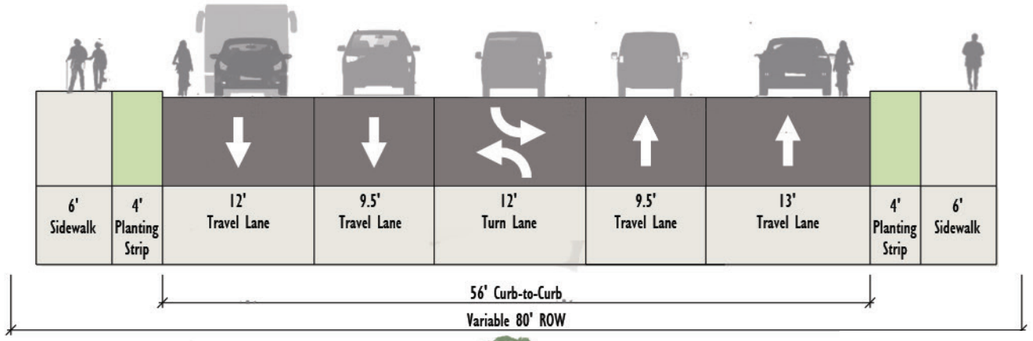
Corridor Segment 2
Varsity Drive to Gorman Street

The primary goal for this segment of the corridor is to redevelop with new buildings sited closer to the street with a well-connected internal street network. Building height should be moderate and contribute to a residential feel.

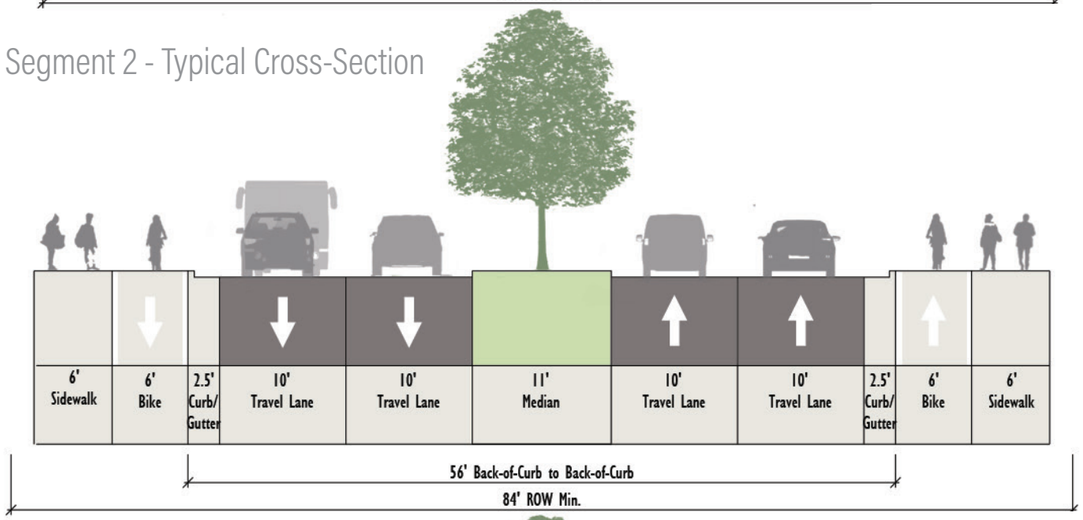
Housing demand in the area suggests additional housing density is appropriate between Centennial and Gorman Street. As redevelopment inevitably occurs in these areas, consideration should be given to the development form and impact to the corridor's character. Setbacks should be maintained for consistency with the suburban character of the area, with taller buildings deeper within the site.

Looking northwest on Avent Ferry.

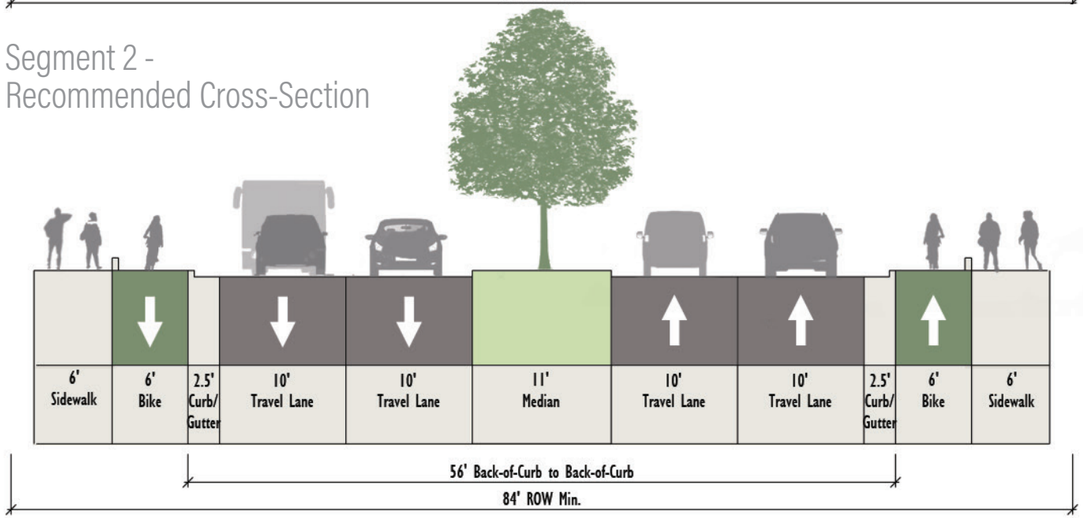
Segment 2 - Existing Conditions

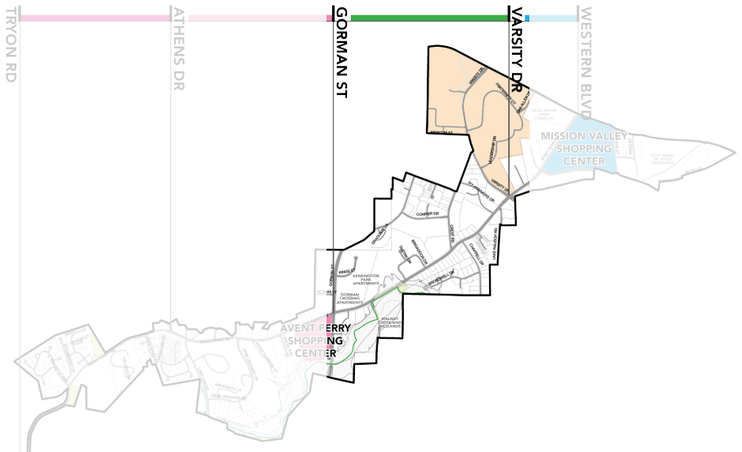


Segment 2 - Typical Cross-Section



Segment 2 - Recommended Cross-Section



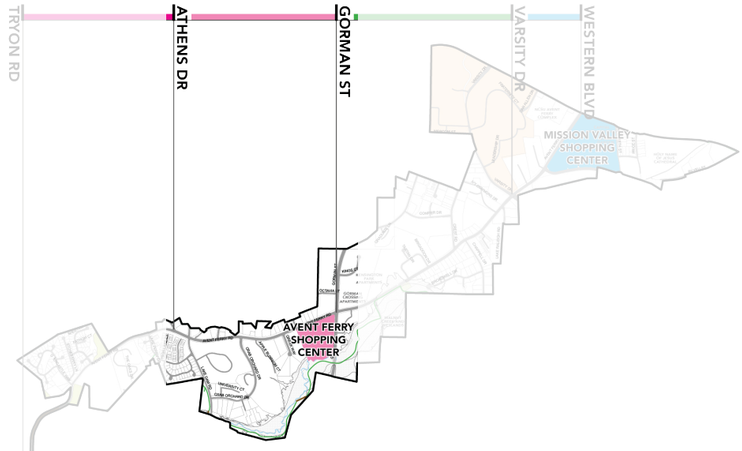


Segment 2 - Recommended Cross Section - Varsity Drive to Gorman Street

The recommended design for this segment is two 10' vehicle travel lanes in each direction, an 11' center planting strip/median, 6' raised and buffered bicycle lanes on both sides of the street and 6' sidewalks on both sides of the street.

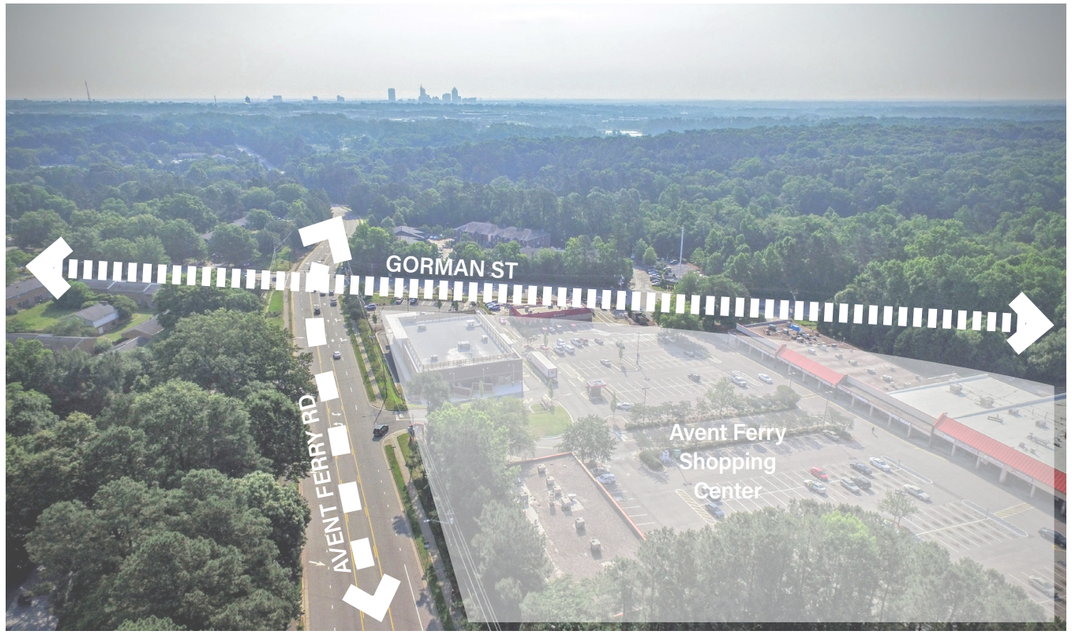
PRIVATE PROPERTY	SIDEWALK ZONE	BIKE ZONE		TRAFFIC ZONE		MEDIAN ZONE	TRAFFIC ZONE			BIKE ZONE	SIDEWALK ZONE	PRIVATE PROPERTY
	SIDEWALK	BIKE LANE		TRAVEL LANE	TRAVEL LANE	MEDIAN	TRAVEL LANE	TRAVEL LANE		BIKE LANE	SIDEWALK	
	6'	6'	2.5'	10'	10'	11'	10'	10'	2.5'	6'	6'	

84' ROW MIN.



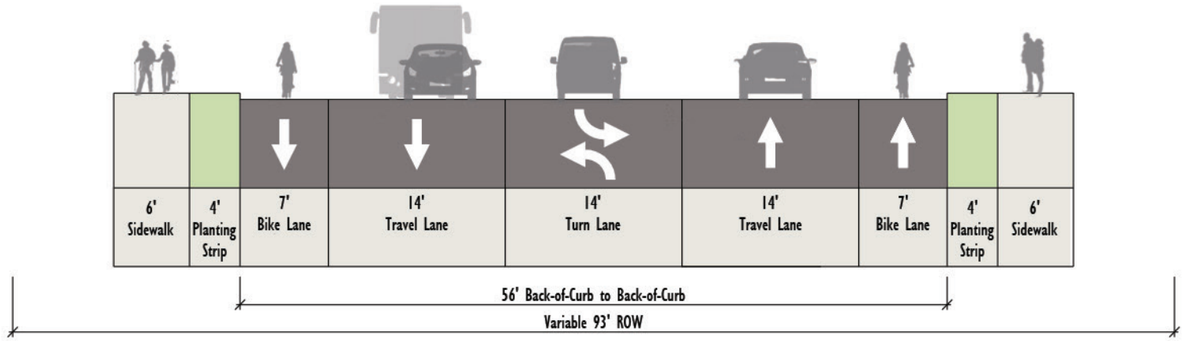
Corridor Segment 3
Gorman Street to Athens Drive

As noted earlier, the Avent Ferry Shopping Center currently anchors the intersection at Gorman Street and provides a number of retail services to the surrounding neighborhood. This pattern should be enhanced by updating the center into a high-quality Neighborhood Mixed-Use Center that adds residential and office space to the tenant mix.

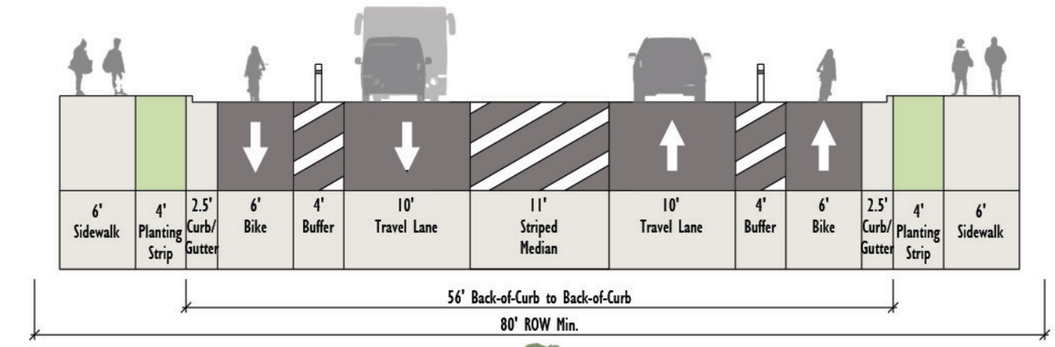


Looking north on Avent Ferry with the Avent Ferry Shopping Center highlighted.

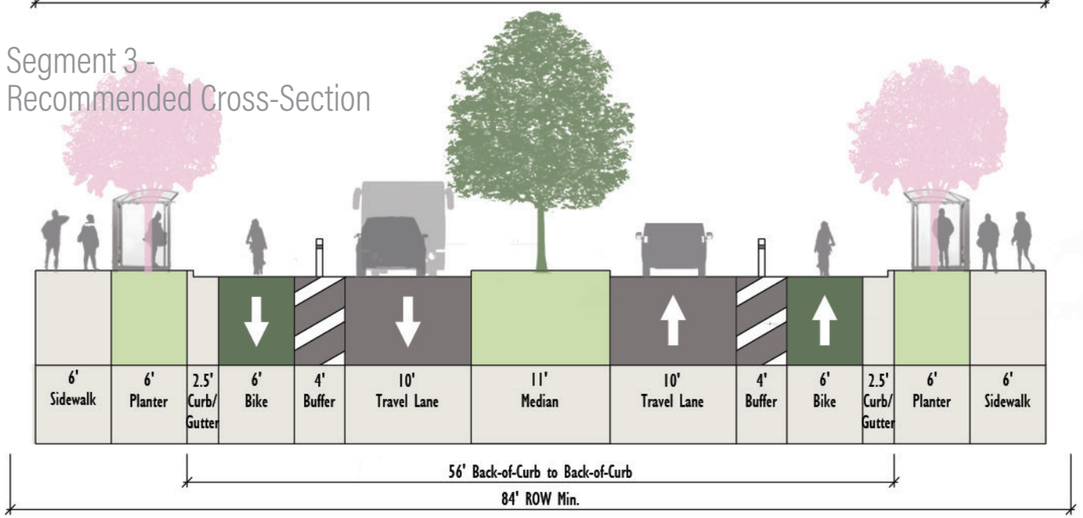
Segment 3 - Existing Conditions

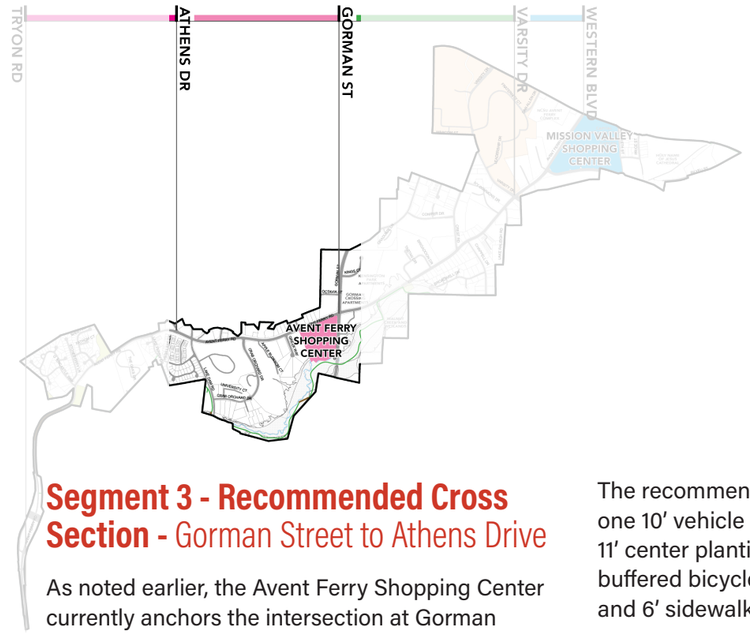


Segment 3 - Typical Cross-Section



Segment 3 - Recommended Cross-Section



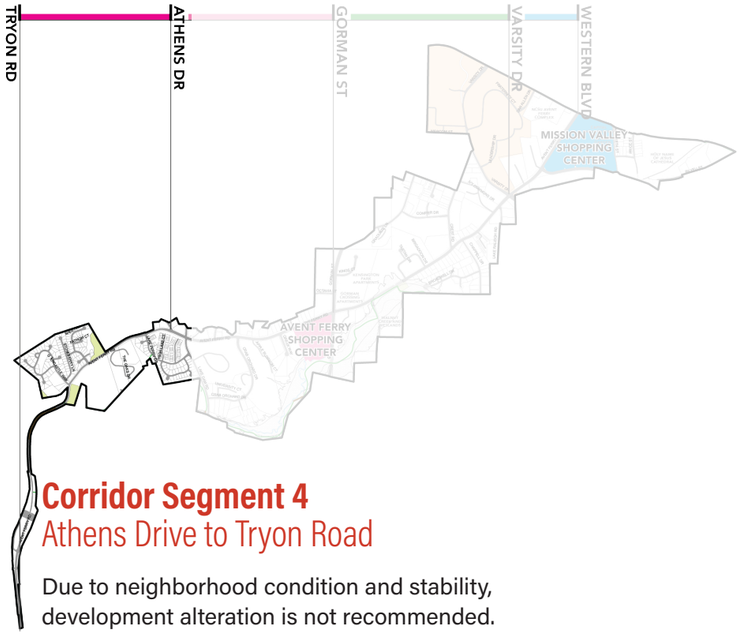


Segment 3 - Recommended Cross Section - Gorman Street to Athens Drive

As noted earlier, the Avent Ferry Shopping Center currently anchors the intersection at Gorman Street and provides a number of retail services to the surrounding neighborhood. This pattern should be enhanced by updating the center into a high-quality Neighborhood Mixed-Use Center that adds residential and office space to the tenant mix.

The recommended design for this segment is one 10' vehicle travel lane in both direction, an 11' center planting strip/median, 9' raised and buffered bicycle lanes on both sides of the street and 6' sidewalks on both sides of the street.

PRIVATE PROPERTY	SIDEWALK ZONE		BIKE ZONE			TRAFFIC ZONE	MEDIAN ZONE		TRAFFIC ZONE	BIKE ZONE			SIDEWALK ZONE		PRIVATE PROPERTY
	SIDEWALK	TREE PLANTER		BIKE LANE		TRAVEL LANE		MEDIAN		TRAVEL LANE		BIKE LANE		TREE PLANTER	SIDEWALK	
	6'	6'	2.5'	6'	4'	10'	1.5	8'	1.5'	10'	4'	6'	2.5'	6'	6'	
			EXISTING 56' CURB-TO-CURB													

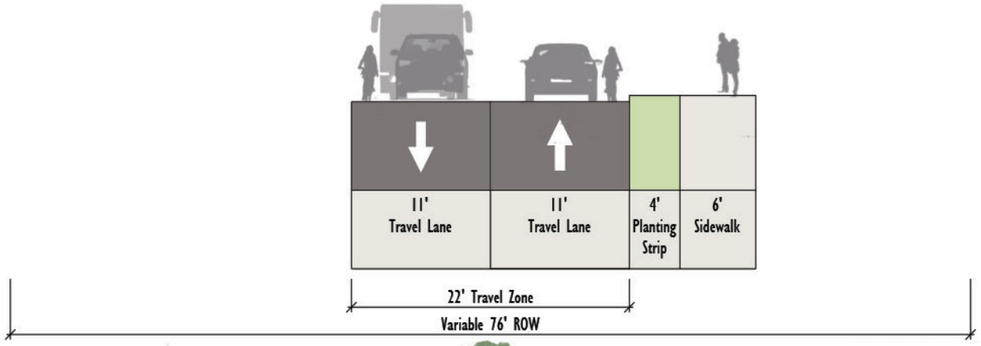


Corridor Segment 4
Athens Drive to Tryon Road

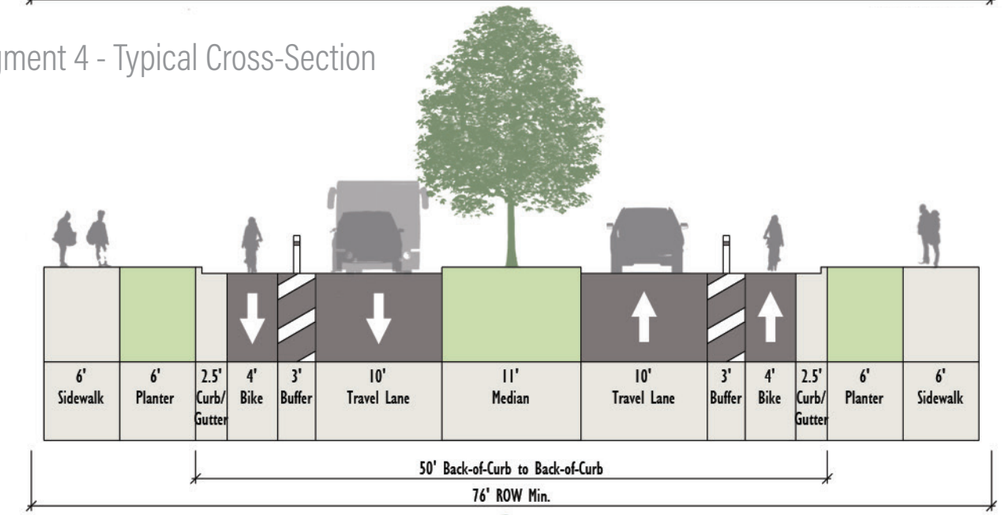
Due to neighborhood condition and stability, development alteration is not recommended. Since this portion of the corridor is anchored and largely occupied by Lake Johnson Park, the primary focus should be to close gaps in the sidewalk and greenway network.

Looking north on Avent Ferry towards Lake Johnson.

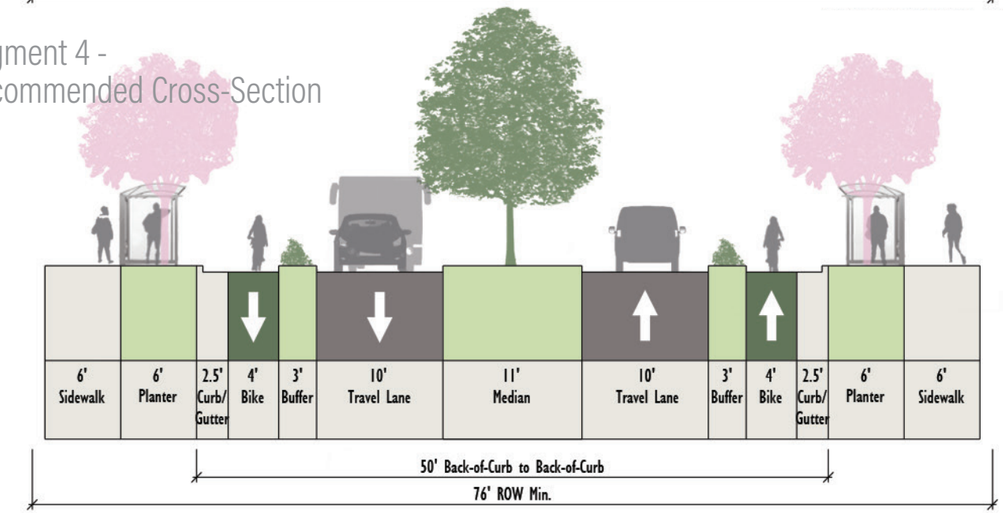
Segment 4 - Existing Conditions

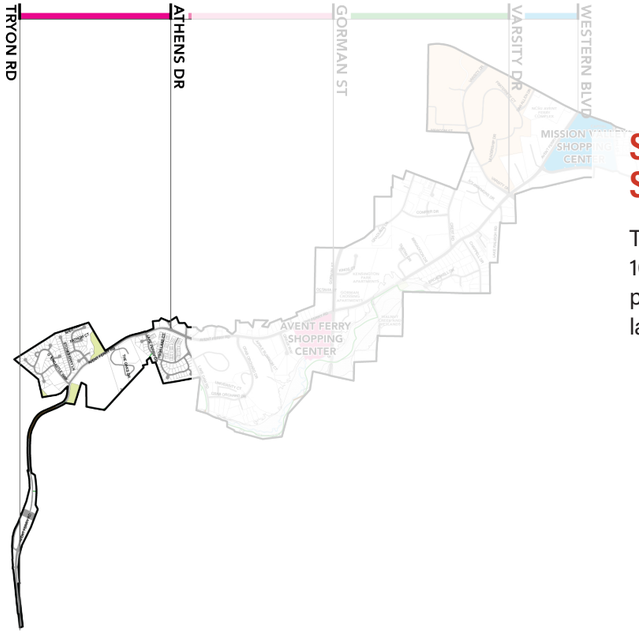


Segment 4 - Typical Cross-Section



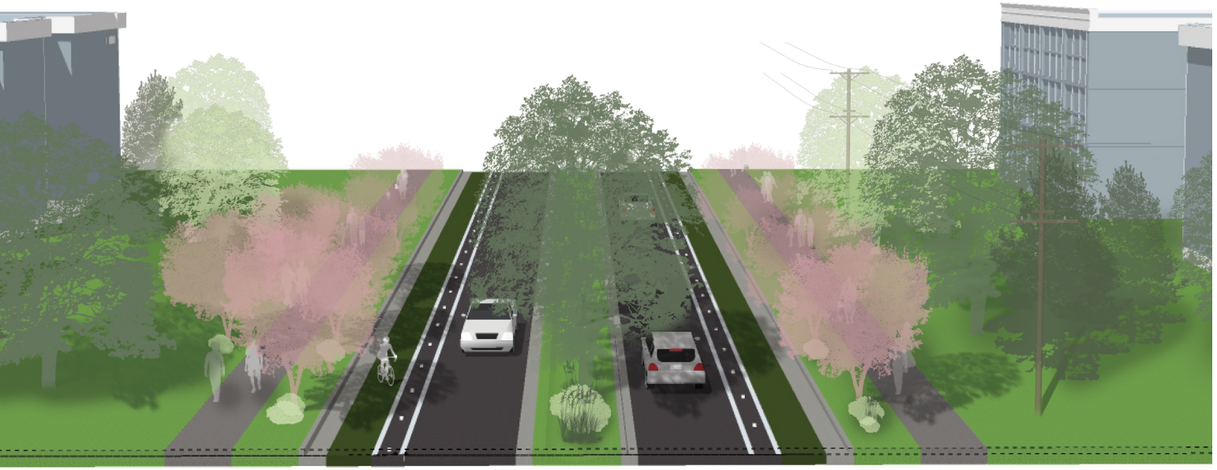
Segment 4 - Recommended Cross-Section

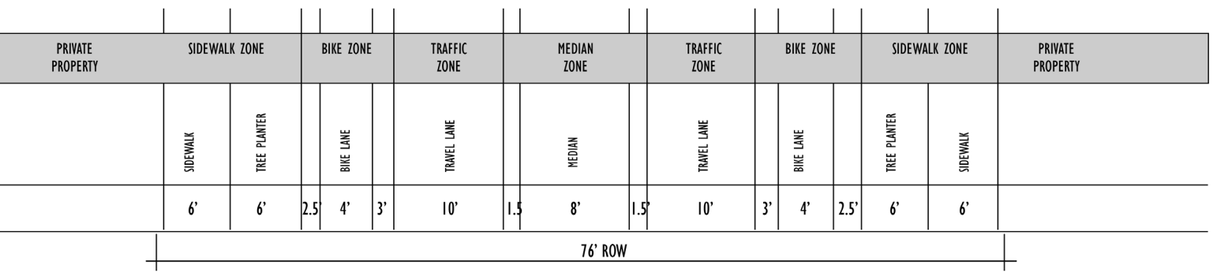




Segment 4 - Recommended Cross Section - Athens Drive to Tryon Road

The recommended design for this segment is one 10' vehicle travel lane in each direction, an 11' center planting strip/median, 6' raised and buffered bicycle lanes and 6' sidewalks on both sides of the street.





Traffic Analysis Results for Final Streetscape Recommendations

The final roadway configurations were analyzed to see how each segment would perform at current levels of traffic volume. The queuing delay was also analyzed for the signalized intersections at the corridor. The analysis used the Synchro analysis software to evaluate both AM and PM peak hour conditions along the corridor. All of the Avent Ferry Road corridor segments would perform at satisfactory level of service for City of Raleigh standards, LOS E or better. The segment and signalized intersection LOS results assumed optimized traffic signal timing splits.

Service at Peak Hours - LOS E Defined

The worst-case scenario for any of the segments is LOS E. According to the North American Highway Capacity Manual, LOS E is defined as "unstable flow, operating at capacity. Flow becomes irregular and speed varies rapidly because there are virtually no usable gaps to maneuver in the traffic stream and speeds rarely reach the posted limit. Vehicle spacing is about 6 car lengths, but speeds are still at or above 50 mi/h(80 km/h). Any disruption to traffic flow, such as merging ramp traffic or lane changes, will create a shock wave affecting traffic upstream... This is a common standard in larger urban areas, where some roadway congestion is inevitable."

At signalized intersections, LOS E estimates a 55-80 second wait. At unsignalized intersections, LOS E estimates a 35-50 second wait.

Avent Ferry Segment Level of Service Summary Table

Segment Name From & To	Type of analysis performed (using HCS 7.4)		LOS						COMMENT
			AM			PM			
	NB/EB	SB/WB	NB/EB	SB/WB	Worst Case	NB/EB	SB/WB	Worst Case	
Western to Varsity	Multilane		C	A	C	C	C	C	Acceptable
Versity to Gorman (NEW)	Multilane		C	A	C	C	B	C	Acceptable
Gorman to Athens	Two Lane w/ Raised Median		C	B	C	C	D	D	Acceptable
Athens to Tryon	Two Lane w/ Raised Median		D		D	E		E	Acceptable

The above table shows the levels of service using the PROPOSED streetscape. All of the proposed streetscape modifications along the Avent Ferry corridor keep LOS consistent with, or improve, previous estimates.

Bicycle and Pedestrian Recommendations

Because Avent Ferry Road evolved to primarily serve vehicular traffic, linkages that provide easy movement for pedestrians and bicycles have significant gaps that must be closed in order to realize the vision of a well-connected corridor linking people with jobs and recreational opportunities. Overall strategies to address these gaps include installation of continuous bicycle lanes along the full length of the corridor, replacement of dead-end parking and multiple curbs with a network of "complete streets", and extending the greenway network to commercial/recreational centers and the City-wide greenway network. A vital element of the Avent Ferry Corridor vision is to improve bicycle and pedestrian connectivity. The complete streets approach to transportation infrastructure and the redevelopment recommendations complement one another to create a vibrant and safe district. Providing active transportation options is key to creating these vibrant spaces.

Raised (above-the-curb) bicycle and pedestrian infrastructure are recommended on both sides of Avent Ferry Road. The buffered and dedicated bicycle facilities would encourage active transportation options and create a safer cyclist experience. The bicycle and pedestrian infrastructure would connect to the planned tunnel under Western Boulevard at the Avent Ferry Road and Western Boulevard intersection. The bicycle and pedestrian tunnel will connect the NCSU Main Campus and Avent Ferry Road.

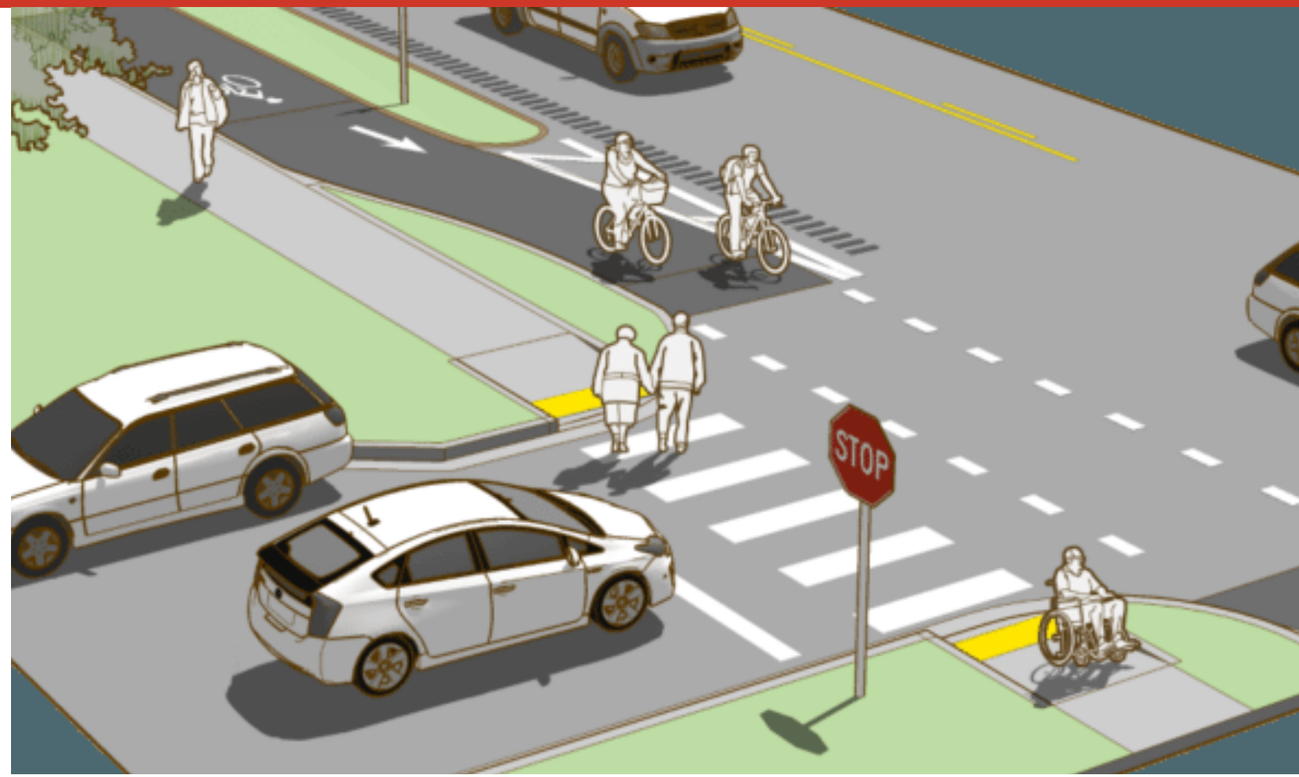
The improved facilities would connect and activate the recommended high-density land use along the corridor. When street-facing retail and commercial developments replace automobile-oriented shopping centers and strip malls along the corridor, the volume of pedestrians and cyclists from residential and employment centers should increase.

The existing right-of-way requires assessing trade-offs between expanded vehicular capacity and bicycle and pedestrian infrastructure. To establish a continuous, raised bicycle lane on both sides of Avent Ferry Road and a robust sidewalk infrastructure, some segments require reducing vehicle lane capacity and constraining future lane expansions. Bicycle and pedestrian infrastructure are key priorities for Avent Ferry Road, given the character of the corridor and the complete streets project approach. Providing dedicated transit lanes and improving bicycle and pedestrian facilities would require reducing vehicular capacity and likely adding delay and congestion during both the AM and PM peak hours.

The current number of conflict points present along the Avent Ferry Road sidewalks and multi-use path is a safety concern. The driveways crossing the current infrastructure could result in accidents between vehicular traffic and cyclists and pedestrians. Parking should be placed behind any retail and commercial redevelopment buildings to reduce these conflict points. Consolidating and moving driveways and situating entrances off Avent Ferry Road to side streets would reduce the number of bicycle and pedestrian accidents.

The recommended roadway design has bicycle and pedestrian crossings at each signalized intersection along Avent Ferry Road, along with some mid-block pedestrian crossing with median refuge islands. The mid-block crossings could be signalized with a call button, meaning the signal would remain green for north- and southbound vehicle traffic unless a pedestrian is crossing the street. Mid-block crossings would likely cause vehicle delays, specifically the two segments with higher traffic volume – between Western Boulevard and Varsity Drive, and between Varsity Drive and Gorman Street.

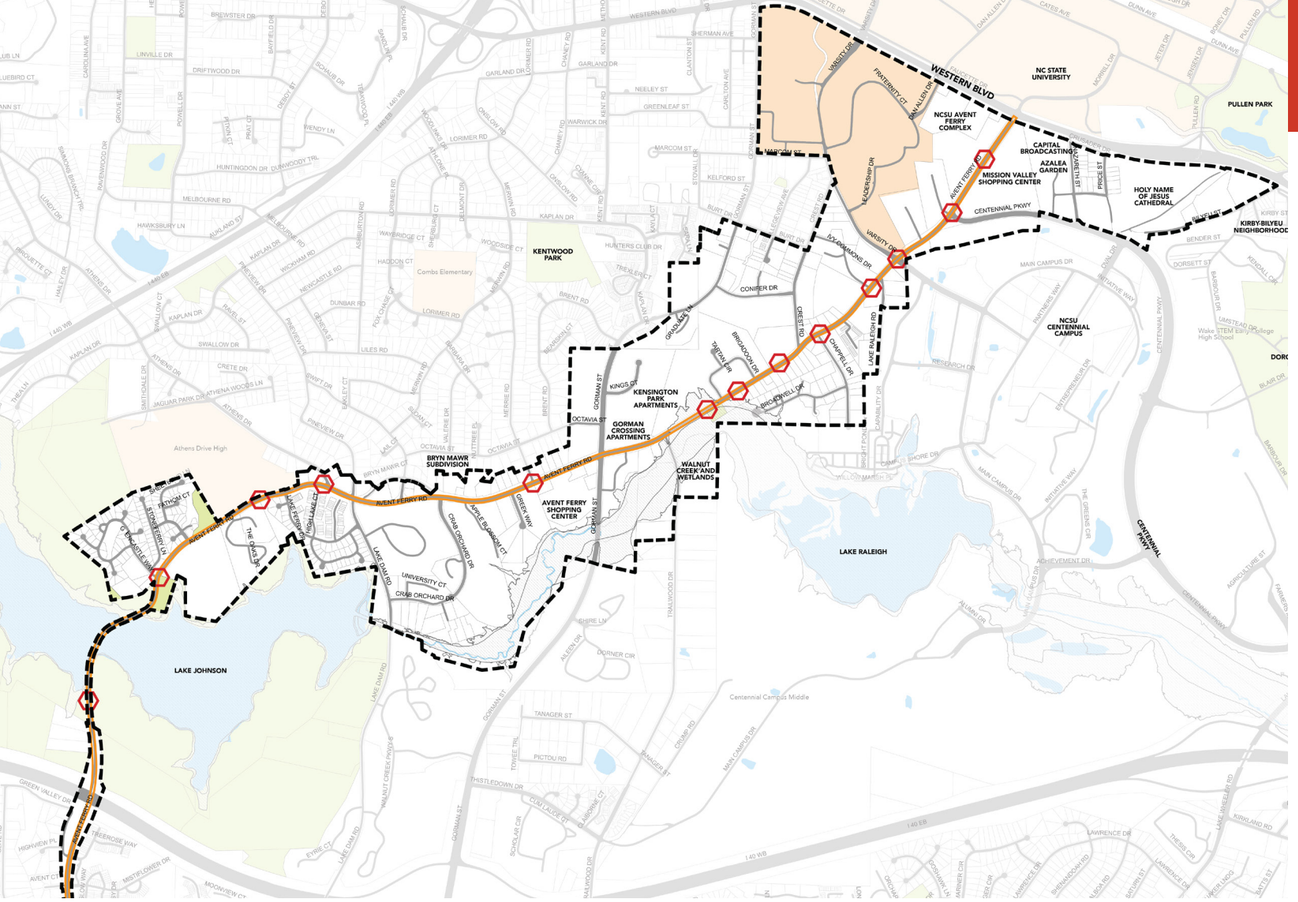
A new signalized pedestrian crossing accessing the Mission Valley Shopping Center would have to be a mid-block crossing with a pedestrian refuge.



An example of a raised and physically separated bike lane. A buffer between the bicyclist and both pedestrians and vehicles provides a safer environment for all.
Image source: ruraldesignguide.com

A mid-block signalized pedestrian crossing was previously tested along Avent Ferry Road between Western Boulevard and Centennial Parkway to access the Mission Valley Shopping center. The results showed placement would cause queuing at that section of the roadway. If the potential realignment to Centennial Parkway moves forward, this would provide an opportunity to install a signalized intersection crosswalk into the Mission Valley Shopping Center development.

The proposed dedicated, raised bicycle lanes would include crossings at signalized intersections, bicycle detector loops, and signal timing adjustments. Impacts to the LOS and queuing delay along Avent Ferry Road during the AM and PM peak hours would be minimal but not reduce any intersection or segment LOS below the City of Raleigh standards.



It is recommended that the red areas outlined in the map above provide enhanced crosswalk treatments to improve safety for pedestrians and cyclists crossing Avent Ferry Road. The treatments will vary based on location and need and will be determined during a future, more detailed study.

Intersections and Crossings

To improve bicycle and pedestrian safety, several new street crossings are required. These crossings are most needed in the long stretches of signalized segments between Western Boulevard and Centennial Parkway, and between Crest Road and Gorman Street. Within these segments, pedestrians are crossing at non-intersection locations (jaywalking) which requires them to estimate vehicle speeds, adjust their walking speed, determine gaps in traffic and predict vehicle travel paths. Installing raised medians or pedestrian crossing islands would improve safety by simplifying crossing maneuvers and allowing pedestrians to cross one direction of traffic at a time. The proposed street sections outlined in the Transportation Recommendations section provides for such medians. Desired locations are indicated in the proposed Connectivity Map. A detailed study of crosswalk designs is necessary in these locations to determine the appropriate crosswalk treatments. Design may be as minimal as basic striping to increase visibility or as intensive as fully controlled crossings with traffic signals and call buttons. Installation of simple concrete islands in the existing center turn lane may be practical short-term solutions to increase safety.

The volume of bicycle traffic in the corridor warrants intersection design to meet the standards outlined by the BikeRaleigh Plan and the Urban Bikeway Design Guide published by the National Association of City Transportation Officials (NACTO). These designs reduce conflict between bicyclists (and other vulnerable roadway users) and vehicles by heightening the level of visibility, denoting a clear right-of-way, and enabling eye contact and awareness with competing transportation modes. Intersection treatments should resolve queuing and merging maneuvers for bicyclists which are often coordinated with timed or specialized signals.

The configuration of safe intersections for bicyclists should include elements such as color, signage, medians, signal detection, and pavement markings. Intersection design should consider existing and anticipated bicyclist, pedestrian, and motorist movements. In all cases, the degree of mixing or separation between bicyclists and other modes is intended to reduce the risk of crashes and increase bicyclist comfort and safety. The level of treatment required for bicyclists at each intersection will depend on the bicycle facility type used and whether bicycle facilities are intersecting the adjacent street and land use. A detailed engineering study should be prepared at each proposed location to determine the appropriate treatments.

See the Materials and Paving Section for further recommendations.

Transit Stops

The combined ridership of NCSU's Wolfline and GoRaleigh routes through the corridor results in the highest transit ridership in the City. This heavy demand warrants enhanced facilities to include large shelters and ample seating. Stops near Mission Valley, Centennial Parkway, Crest Road, and Gorman Street should be enlarged. All stops should, at a minimum, have a concrete pad, bench, and shelter. Where stop consolidation is recommended, any opportunity to share transit amenities should be explored. Sharing facilities will improve user experience for all riders and reduce stop location confusion.

Bike Lanes

Bicycle ridership is also heavy in the corridor. A network of interconnected bike lanes is emerging, but critical linkages should be made to connect major destinations. Designated bike lanes currently exist on Gorman Street and on Avent Ferry Road from Gorman Street to Athens Drive. Adding continuous lanes from Gorman Street to Western Boulevard should be a priority. Lateral connections via Centennial Parkway, Varsity Drive, and Crest Road are also important. New bike lanes will be provided as part of the Lake Johnson causeway reconstruction and should be extended to connect to existing lanes on Avent Ferry Road.

To the maximum extent possible, cyclists should be separated or protected from automobile traffic. The ideal bicycle lane should be raised 6" above the roadway, similar to a sidewalk, and separated from both pedestrians and automobiles by a vegetated strip. Where such a condition is not feasible, a combination of pavement material changes and/or mountable curbs should be employed.

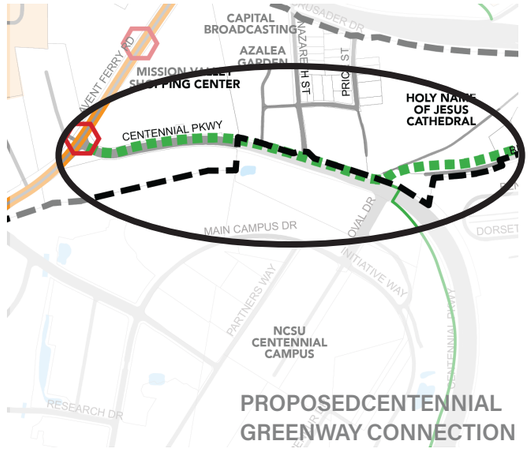
Intersections and driveway cuts should also receive special treatments to minimize bicycle-automobile conflicts. These treatments should follow those outlined in the BikeRaleigh Plan and the Urban Bikeway Design Guide published by the National Association of City Transportation Officials (NACTO). See the Materials and Paving Section for further recommendations.

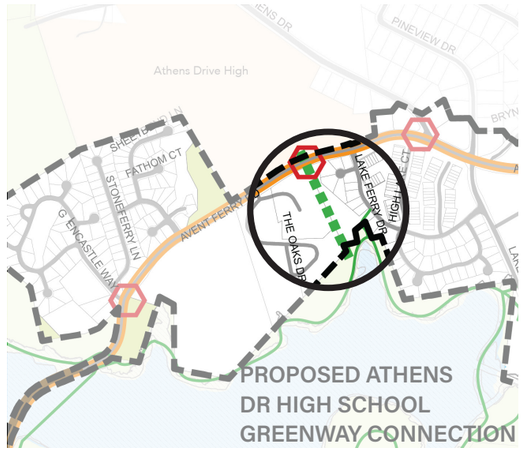
Parks, Greenways & Stroll Ways

Greenways consistently ranked as a priority among public workshop attendees and survey respondents. Currently, a greenway exists linking Lake Johnson to Centennial Campus on the southeast side of Avent Ferry Road. A greenway also extends along the south side of Western Boulevard and provides a connection to the larger Raleigh greenway system. However, connections to and across Avent Ferry Road are extremely limited. These connections are at the intersection of Western Boulevard, a point near Brigadoon Drive and Lake Johnson. The City has acquired easements which should be used to provide greenway connections to Athens Drive High School and Kaplan Drive. The Athens Drive High School connection would provide direct access to overflow parking and the Athens Drive Public Library. The Kaplan Drive connection would provide access to residents through the Kensington Park development and Kentwood City Park. Greenway construction in these easements should be prioritized.

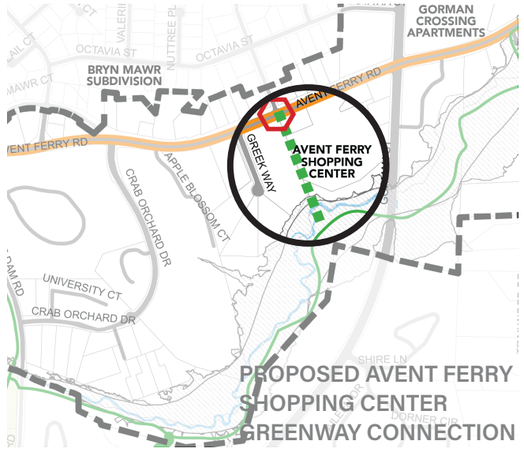
Greenway entrances should be enhanced with wayfinding signage that shows their locations within the overall system and provides distances to regional destinations such as Dorthea Dix Park, State Farmers Market, NCSU, Downtown, Lake Johnson, Meredith College, North Carolina Museum of Art, Crabtree Valley, and North Hills.

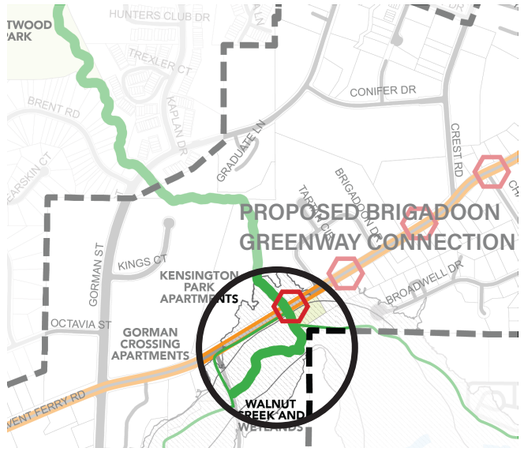
The greenway intersects Avent Ferry Road near Brigadoon Drive. The City-owned property on the southeast side of Avent Ferry Road is an excellent opportunity to create a neighborhood greenway hub. An improved crosswalk with traffic signal is essential in this location.





An example of a mid-block crossing across a planted median with stormwater collection. Photo source: buffalorising.com, Newell Nussbaumer; Buffalo, NY





"Stroll ways" are multi-purpose paths that create a safe environment for less experienced or younger bicyclists, or for pedestrians that prefer to walk in a pathway that is separated from the bike and pedestrian networks design into the typical Avent Ferry cross sections. These are often implemented as large sidewalks with-in private developments. As redevelopment occurs along the corridor, developers should provide stroll ways to circulate within their developments. These stroll ways should provide connections to the City maintained network of sidewalks and bike lanes.

Lake Johnson attracts a large number of visitors. At peak times, the existing parking lots on Avent Ferry Road are overwhelmed and cause congestion at park entrances. Where possible, these parking lots should be expanded and include access improvements. Additionally, signage on Avent Ferry Road in the vicinity of Athens Drive and Lake Dam Road should be provided directing users to existing parking at Athens Drive High School, Lake Dam Road, and the Crowder Center. This should reduce demand at the Avent Ferry Road facilities.

Safety

Public demand for upgraded pedestrian and bicycle facilities has been consistently emphasized in this study. Participants noted locations throughout the corridor where improvements are needed to encourage safe pedestrian crossing and enhanced bicycle accommodations. In addition to closing the connectivity gaps outlined previously, installation of safe crosswalks at common crossing points should be a top priority. Other strategies, outlined in more detail later in this report include provisions for grade separated bicycle lanes, intersections designed to isolate bicycle and vehicular lanes, and sidewalks located a safe distance from vehicular traffic.

The proposed Connectivity Map highlights specific locations where safety may be dramatically improved. It also outlines a theoretical street grid that should be implemented as individual properties are redeveloped. Each new redevelopment plan should attempt to provide the connections described on this map.

Redevelopment of Mission Valley Shopping Center and Avent Ferry Shopping Center will eventually create nodes of activity that bookend the corridor segment between Western Blvd and Gorman Street. Redevelopment in the rest of the corridor should occur at a lower intensity than either of the shopping centers but implement several key design principles. This will help create a network of connected streets and pedestrian and bicycle paths. Parking between buildings and Avent Ferry Road should be eliminated, dead-end streets avoided, and driveway cuts reduced. Redevelopment should interconnect projects with internal streets and access for pedestrians and cyclists. This will allow residents to move between developments without necessarily accessing Avent Ferry Road.

Proposed Comprehensive Plan Amendments for Raleigh Street and Greenway Plans:

- The dashed, dark blue streets shown in the map above are recommended additions to the Street Plan
- The dashed, dark green lines shown in the map are recommended additions to the Capital Greenway Master Plan

The proposed streets within the focus areas are recommended as Main Street, Parallel Parking street type. For more information on this street type, please see the site plan for each focus area on .pgs 48 and 50. The recommended streets outside of the focus areas would be Neighborhood Streets, refer to Unified Development Ordinance for more details on this street type.

CONNECTIVITY LEGEND

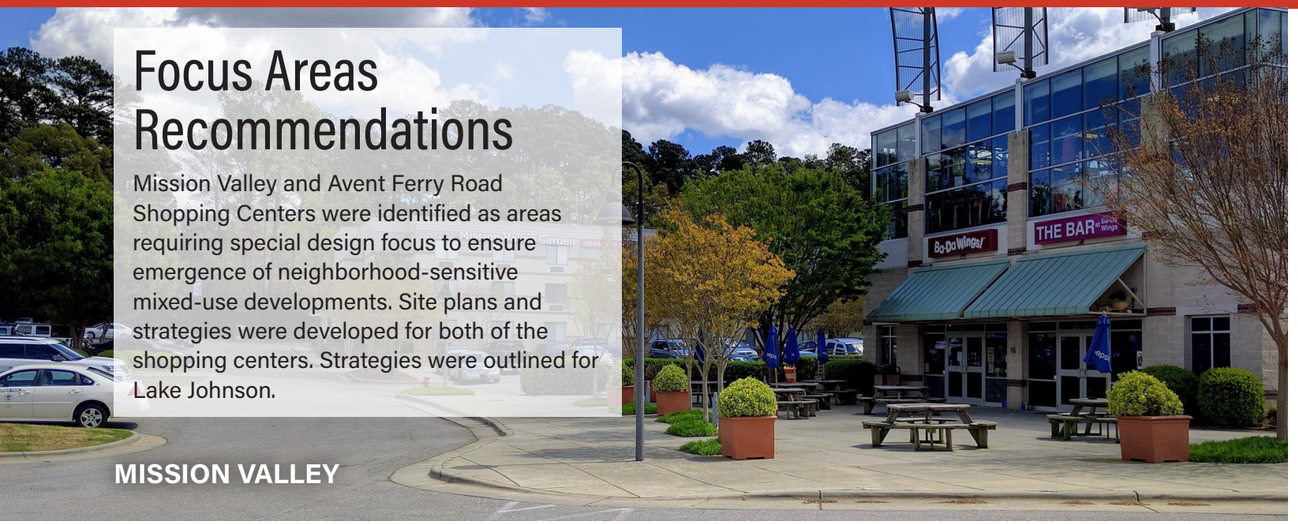
- Potential BRT Station
- Wolfline Stops
- GoRaleigh Routes
- GoTriangle Stops
- Recommended Stop Consolidation or Removal
- Existing Streets
- PROPOSED Street in Raleigh Street Plan
- RECOMMENDED Addition to Raleigh Street Plan
- RECOMMENDED Separated bicycle facility
- Existing Greenway Trail
- PROPOSED Trail in Capital Area Greenway Plan
- RECOMMENDED Addition to Capital Area Greenway Plan
- RECOMMENDED Improved bicycle/pedestrian crossing
- Parcels
- Lakes & Streams
- Parks and Open Space
- Focus Areas
- Floodplain

0 .5 1 MILES

N

Focus Areas Recommendations

Mission Valley and Avent Ferry Road Shopping Centers were identified as areas requiring special design focus to ensure emergence of neighborhood-sensitive mixed-use developments. Site plans and strategies were developed for both of the shopping centers. Strategies were outlined for Lake Johnson.



MISSION VALLEY

AVENT FERRY SHOPPING CENTER

LAKE JOHNSON

Strategies for MVSC:

- Enhanced street network
- Devise a master plan that includes a mix of uses at the Mission Valley Shopping Center.
- Upgrade and renovate the Mission Valley Shopping Center to attract a wider variety of food and beverage options; for example, breweries, international markets, restaurants, and local health food stores.
- Integrate flexible work space, housing, and lodging.
- Invest in multimodal transportation infrastructure that provide access to the Mission Valley area from NCSU, Centennial Campus, Dix Park, and points south along the corridor.
- Development scenarios including TOD overlay

Mission Valley Mixed-Use Regional Destination

Situated along the southern edge of the business and civic districts of Downtown Raleigh, this area is a key center of influence and close to NCSU, parks, public facilities, and the downtown business and government core. This area has potential for a successful suburban retrofit, with new, denser mixed-use office and retail development. Redevelopment could include replacing Mission Valley's existing buildings, and/or infilling surface parking between the existing Mission Valley Shopping Center and the fast food, and convenience-oriented retail located on Western Boulevard one-quarter mile to the west.

Strategies for AFSC:

- Devise a strategic master plan to include the Avent Ferry Shopping Center and NSCU (former and existing Greek housing) sites.
- Upgrade and renovate the Avent Ferry Shopping Center to integrate more traditional work spaces and housing options for a walkable mixed-use environment.
- Provide connectivity from redeveloped areas to existing greenways and pathways for an enhanced bicycle and pedestrian network.
- Street connectivity

Avent Ferry Shopping Center Mixed-Use Neighborhood Center

Repositioning this area would create an opportunity for additional retail uses and other new housing options. Such redevelopment would also strengthen existing stores and businesses in this section of the corridor and provide opportunities for others to relocate to this "central place."

Strategies for Lake Johnson:

- Invest in transportation and park infrastructure for improved and appropriately scaled access to the Woodland Center and other Lake Johnson park destinations.
- Improve greenway access and wayfinding to Lake Johnson Park from Dix Park.
- Enhanced access and parking

Lake Johnson Recreational Area

Lake Johnson Park is bifurcated by Avent Ferry Road and is a popular regional and local recreational destination that also serves as a significant ecological resource and preserve. The park includes the Thomas G. Crowder Woodland Center.

Mission Valley Shopping Center

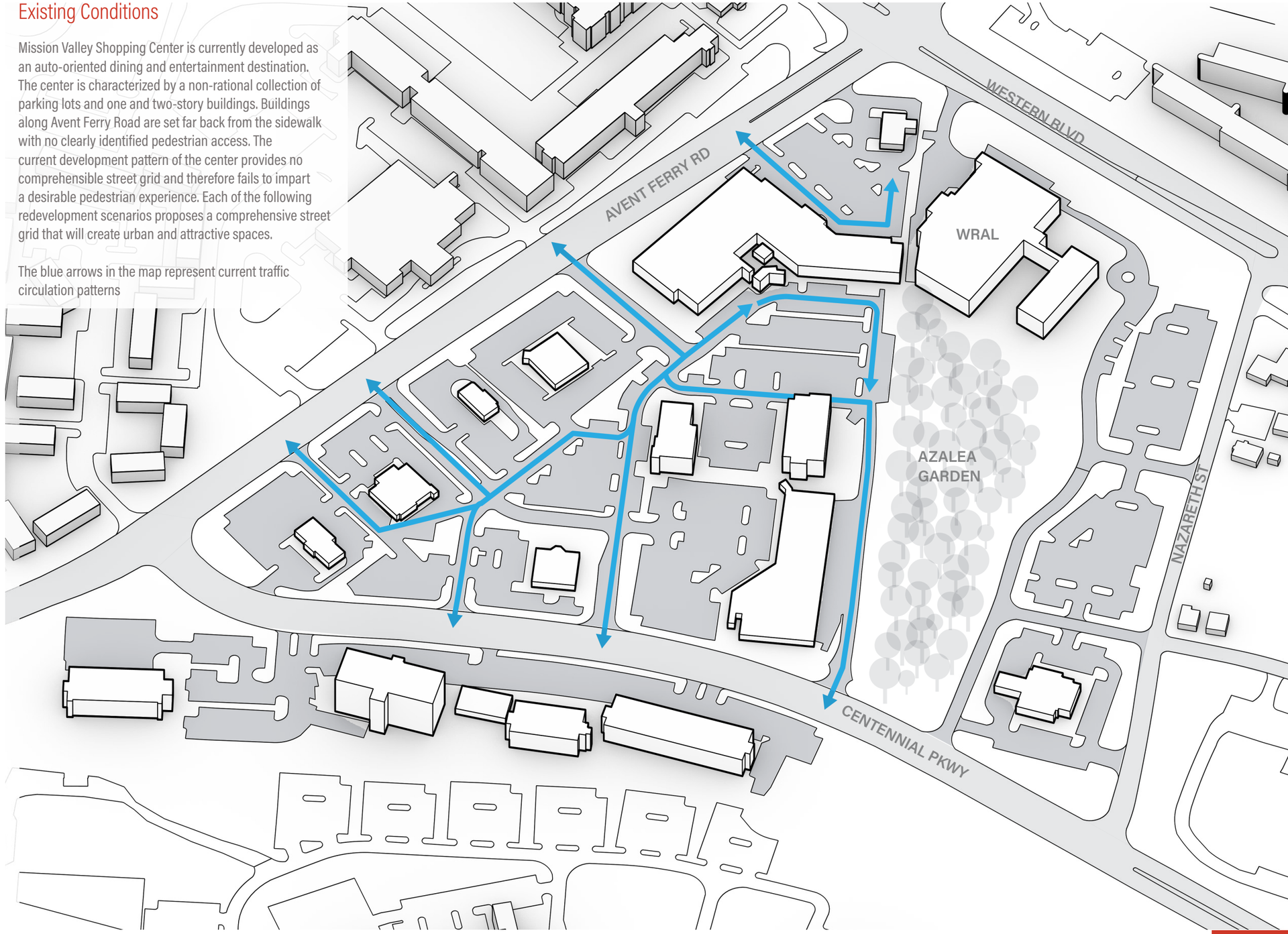
Vision

Mission Valley Shopping Center (MVSC) and the surrounding properties should be redeveloped as a regional mixed-use center and serve as a catalyst and anchor for further development along the corridor. The development should leverage transit opportunities provided by the proposed BRT route along Western Boulevard, mixed-use developments on Centennial Campus and adjacent properties, and the development of the Dorthea Dix Park property. The community should emerge as a highly connected nucleus of activity linking all the surrounding uses. The redevelopment should substantially increase residential density and provide for a diverse mix of street-level retail uses. The community should continue to support the diverse collection of small business that give the existing shopping center its international character and also allow for the inclusion of anchor retailers, hotel, and other regional amenities. Public and semi-private space should be abundant and provide diverse programming opportunities indicative of a vibrant urban neighborhood. Green infrastructure to reduce stormwater impacts and lessen the carbon footprint are encouraged. Much denser development, including taller buildings, should be considered in this area.

Existing Conditions

Mission Valley Shopping Center is currently developed as an auto-oriented dining and entertainment destination. The center is characterized by a non-rational collection of parking lots and one and two-story buildings. Buildings along Avent Ferry Road are set far back from the sidewalk with no clearly identified pedestrian access. The current development pattern of the center provides no comprehensible street grid and therefore fails to impart a desirable pedestrian experience. Each of the following redevelopment scenarios proposes a comprehensive street grid that will create urban and attractive spaces.

The blue arrows in the map represent current traffic circulation patterns



MVSC Planning Recommendations

Height and building relationships to the street are key elements in defining the look, feel, and experience of an urban neighborhood. Several concepts were tested during the public workshops and in a follow-up online survey. The consensus among participants and respondents was to set a height limit of five to seven stories for the building façades facing the street with a maximum height of seven stories. Additional height allowances should be considered if other public space or amenities are proposed. Additional height should also consider topography, proximity to adjacent properties, and shade/wind impacts along pedestrian corridors.

Respondents emphasized the importance of a quality pedestrian experience that provides ample sidewalk space for outdoor dining and amenities. To accomplish this, an Urban Limited Frontage is recommended. Typically, Urban Limited Frontages are applied where the desire is to keep buildings relatively close to the street, but parking is undesirable between buildings and the curb. The modified frontage allows a 0' setback with a maximum of 20' between curb and face-of-building. At MVSC, any landscaping included within the frontage should be met with a mix of landscape areas, street trees, trees in pits or planters, and wide sidewalks. Paving is desirable within the setback to provide urban streetscape amenities. Trees should be planted according to the Raleigh Tree Manual to ensure their health and longevity.

The existing Avent Ferry Road right-of-way is 95'. This width does not provide adequate space to meet demands for a wider sidewalk, street trees, and protected bicycle lane. Therefore, future development should dedicate 7'-9' (variable) right-of-way along Avent Ferry Road to accommodate a 14' minimum sidewalk, 6' bike lane, and 6' planting/amenity strip. Maximum streetscape width from back of curb to build-to line should be 20'. This includes the recommended 14' sidewalks.

To accommodate all the goals described above, MVSC will eventually need to be rezoned. A rezoning will allow for the desired increase in residential density and create an urban environment comfortable for pedestrians and bicyclists.

Low Density Scenario

This development scenario maintains a five to seven story building height throughout. This scenario was envisioned to represent the lowest intensity of redevelopment for the site. Even at this low intensity scale, a comprehensive street grid will drastically improve the pedestrian experience of the shopping center. The proposed height in this scenario will also accommodate a mix of uses including retail, office, and residential.

An additional goal within the MVSC vision is to maximize its proximity to a future BRT stop near the Avent Ferry Road and Western Boulevard intersection. A Transit Oriented District (TOD) overlay should be considered for this area and structured parking emphasized. The TOD provides for reduced parking requirements and limits the amount of allowable surface parking. To further leverage the benefits of the planned BRT station, adequate public space should be provided adjacent to the station. This space should serve as a gateway/ gathering area for transit riders. Current design guidelines call for buildings to occupy the property corners at street intersections.

Connectivity is a critical concern for the success of the future MVSC redevelopment. Currently the site consists of a confusing network of surface parking and poor connection to Centennial Campus to the south as well as student housing to the west. Redevelopment should clarify internal circulation and provide safe and intuitive connections to neighboring properties.

Pedestrian crossings to Centennial Campus should be coordinated with NCSU and accommodate pedestrian "desire lines" identified in their recently completed campus connectivity plan. Along Avent Ferry Road, pedestrian crossings should be spaced no more than 600' apart. Pedestrian refuges should be provided in the center median to facilitate Avent Ferry Road crossings.

Medium Density Scenario

This development scenario maintains a five to seven story building height at the edges of the shopping center with the exception of a single centralized twelve story tower. The same improved street grid is utilized in this scenario. In exchange for a selectively located increased allowance for height, this scenario proposes a pedestrian promenade that extends the length of the shopping center from north to south. Tadeoffs for additional height should be leveraged additional public amenities.

Active public space is critical to the success of an urban mixed-use development and facilitates social interactions and community cohesiveness. Public spaces of varying sizes should be distributed throughout the development. A large central public space should anchor the development. Other public and semi-public spaces should include the BRT plaza, sidewalk dining, and small pocket parks. Rooftop plazas and gardens are also encouraged.

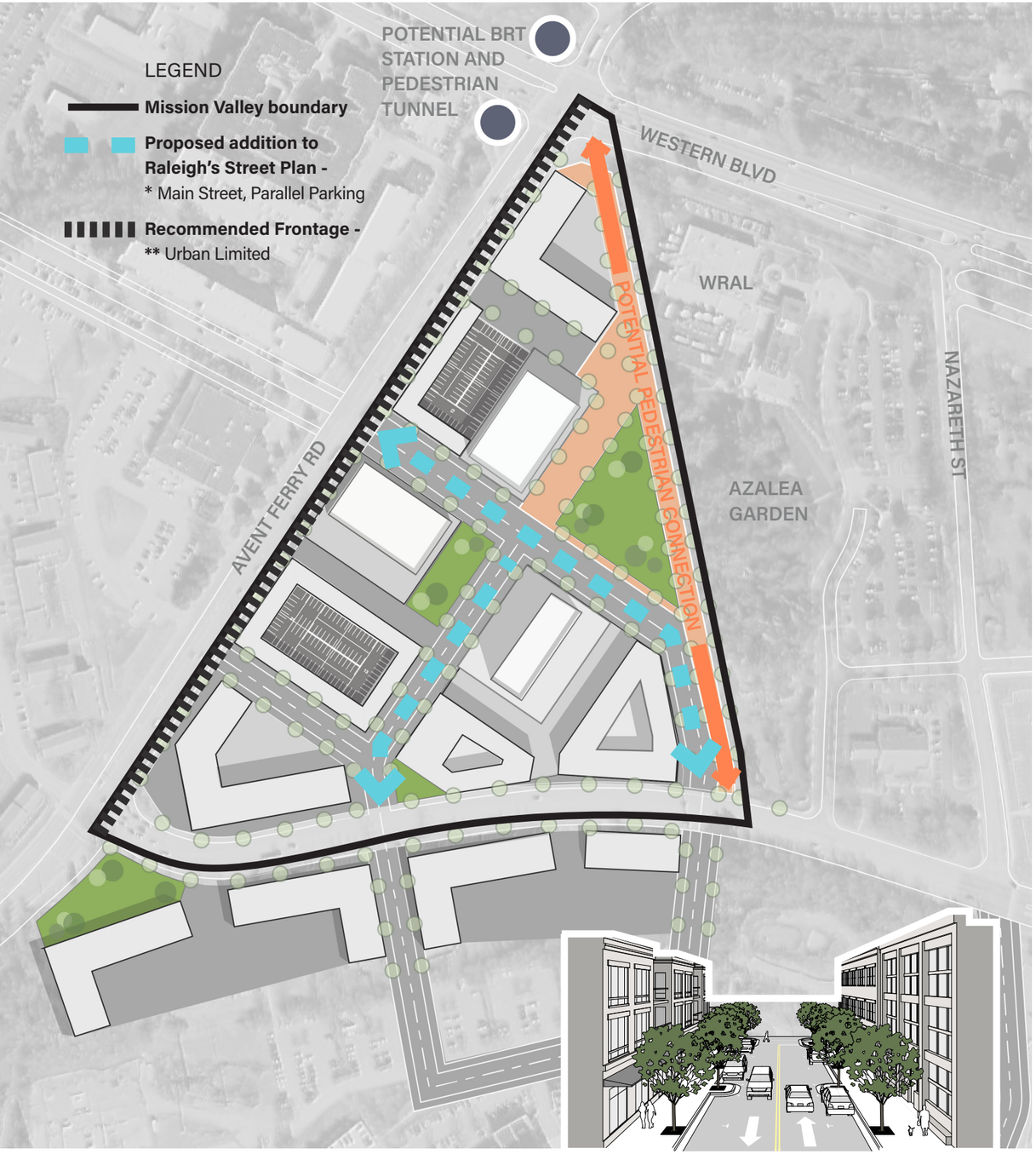
Mission Valley Shopping Center should be considered part of a larger district that incorporates the properties extending eastward to the Holy Name of Jesus Cathedral. Redevelopment on these properties should also maximize their proximity to the future BRT stations, Dorthea Dix Park, and Centennial Campus. Buildings on these properties should be of a complimentary scale to the shopping center, but taper in height towards the Cathedral. Nazareth Street should be recognized as a primary bicycle and pedestrian connection for students moving between NCSU's Centennial and Main Campuses.

A detailed master plan for this area would help to ensure a unified redevelopment vision for MVSC.

High Density Scenario

The most intense redevelopment scenario envisioned will still maintain a five to seven story building height at the edge of the shopping center. This rendering envisions multiple towers in excess of twelve stories centrally located to the site, with the tallest building shown at twenty stories.

This scenario would garner the most leverage for the community and should only be considered if significant open space and public amenities are provided in exchange. This rendering envisions a large central park, bordered by a full length pedestrian promenade, and a public plaza.

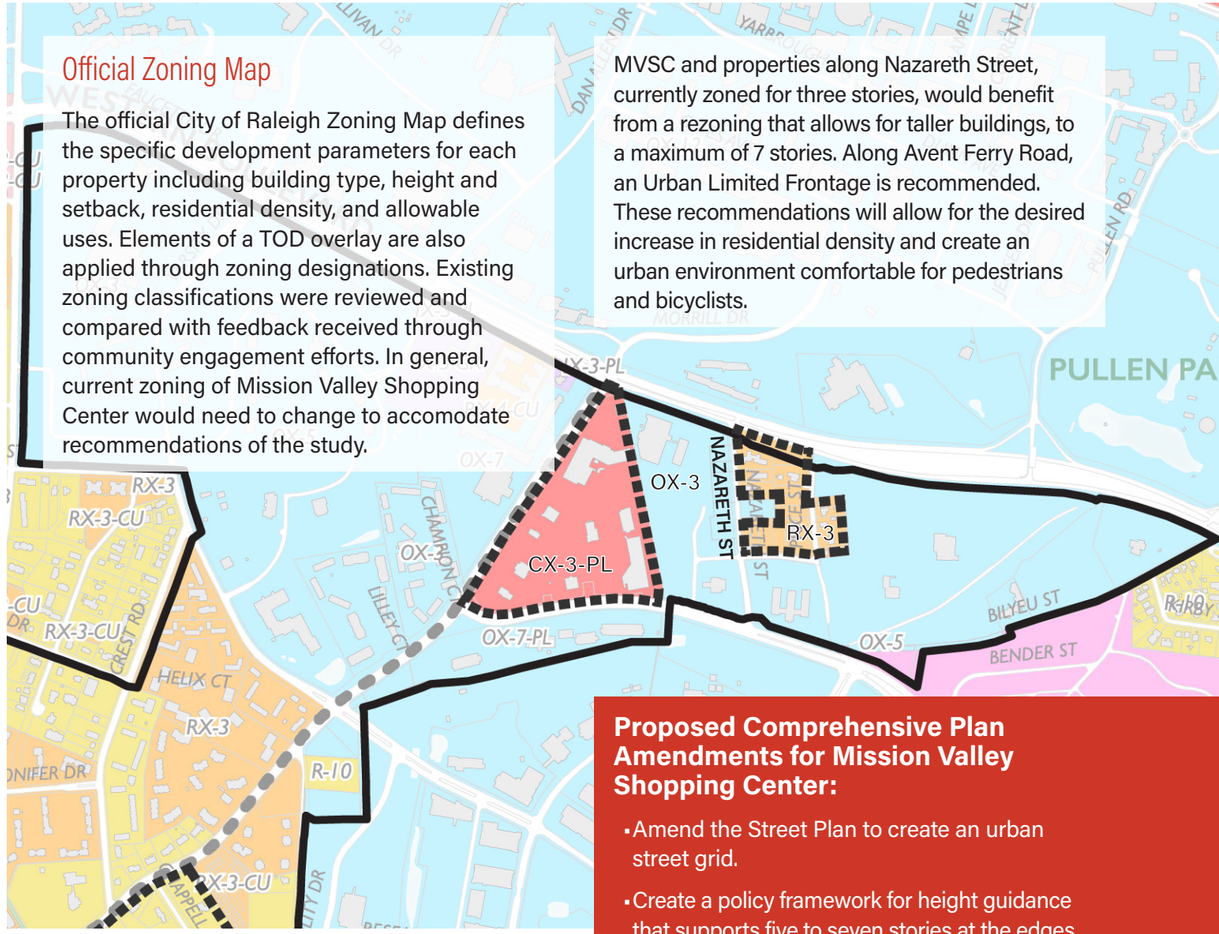


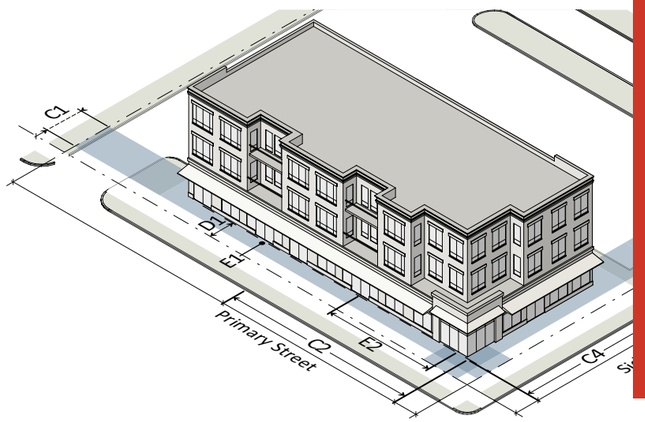
* Example image of Main Street, Parallel Parking from Raleigh's Unified Development Ordinance

Official Zoning Map

The official City of Raleigh Zoning Map defines the specific development parameters for each property including building type, height and setback, residential density, and allowable uses. Elements of a TOD overlay are also applied through zoning designations. Existing zoning classifications were reviewed and compared with feedback received through community engagement efforts. In general, current zoning of Mission Valley Shopping Center would need to change to accomodate recommendations of the study.

MVSC and properties along Nazareth Street, currently zoned for three stories, would benefit from a rezoning that allows for taller buildings, to a maximum of 7 stories. Along Avent Ferry Road, an Urban Limited Frontage is recommended. These recommendations will allow for the desired increase in residential density and create an urban environment comfortable for pedestrians and bicyclists.





** Example image of Urban Limited Frontage from Raleigh's Unified Development Ordinance

Proposed Comprehensive Plan Amendments for Mission Valley Shopping Center:

- Amend the Street Plan to create an urban street grid.
- Create a policy framework for height guidance that supports five to seven stories at the edges of the shopping center with allowances for additional height considered in exchange for significant public amenities
- Urban Form for the shopping center should conform with the Urban Limited Frontage designation along Avent Ferry Road
- New internal street networks should support buildings closer to the street edge
- Due to its proximity to a future BRT stop, the site is recommended for consideration as a future Transit Overlay District with potential for denser mixed-use development

Avent Ferry Shopping Center

Vision

The Avent Ferry Shopping Center (AFSC) marks a transition between the higher density multi-family developments to the northeast and the single-family neighborhoods southwest of Gorman Street. As such, AFSC should be repositioned as a mid-density lifestyle mixed-use center that creates opportunities for additional retail, office, and housing options. AFSC should redevelop in a manner sensitive to the adjacent single-family neighborhoods in scale and density, and provide the community with a friendly, walkable, mixed-use amenity. Diversification of uses should expand entertainment and recreational offerings for the surrounding neighborhoods. A central public space or square should be included in the long-term redevelopment strategy.

AFSC Planning Recommendations

Ideally, the Avent Ferry Shopping Center would be entirely redeveloped in a single phase to create a neighborhood mixed-use center. However, long-term lease agreements and recent out-parcel construction make that unrealistic. Therefore, short-term renovations and redevelopment should be encouraged to improve connectivity, appearance, and raise the center's identity as a neighborhood hub.

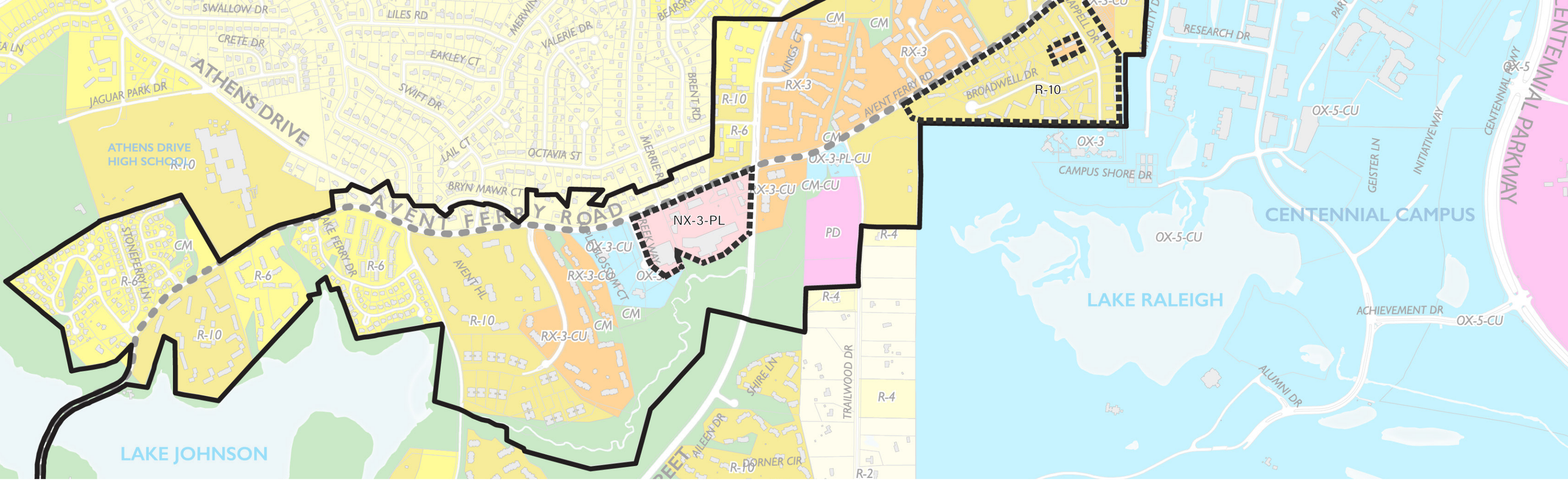
Proposed Comprehensive Plan Amendments for Avent Ferry Shopping Center:

- Amend the Street Plan to create an urban street grid
- Create a policy framework for height guidance of three to five stories, with height along Avent Ferry Road not exceeding three stories. Additional height should be focused away from existing detached residential properties
- Urban Form for the shopping center should conform with the Green Frontage designation
- Provide connection from the site to the Walnut Creek Greenway

Potential Redevelopment Pattern

Any redevelopment scenario for the Avent Ferry Shopping center should establish an urban street grid to position the site as a pedestrian friendly neighborhood center. Building heights should not exceed three stories along Avent Ferry Road and buildings as tall as five stories should be considered at other locations on the property. This redevelopment scenario lays out a comprehensive street grid and potential building placement. Redevelopment of this site should include retail, office, and residential uses.

*Example image of Main Street, Parallel Parking from Raleigh's Unified Development Ordinance



The AFSC is outlined with its existing zoning labeled. By recommending increased height and a green, urban frontage at the Avent Ferry Shopping Center, wider sidewalks and more robust public amenities will be possible.

Workshop participants and online survey respondents indicated that building height at the street frontage should be limited to three stories. Building heights internal to the site should be set capped at five stories. Additional height may be authorized if more public space is dedicated. However, expanded height should only be allowed on the wetland-facing side of the property. Height on the Avent Ferry Road frontage should not exceed three stories.

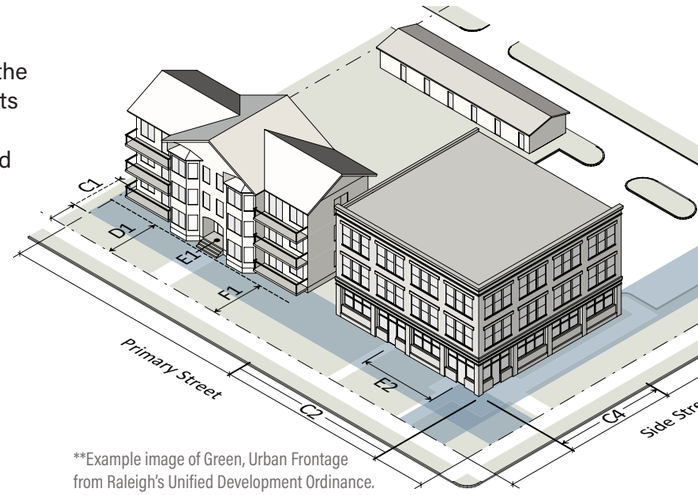
Similar to the MVSC, Green Frontage areas are intended to provide space to accommodate a wide sidewalk with street-side dining and other amenities. The landscaping within the frontage should include a mix of landscape areas, street trees, trees in planters, and wide sidewalks. Paving is desirable within the setback to support urban streetscape amenities. Trees should be planted according to the 2015 City Tree Manual prepared by the City of Raleigh Parks, Recreation and Cultural Resources Department, and Urban Forestry to ensure their health and longevity.

It is important to improve pedestrian connectivity within the Corridor and surrounding areas. The site is adjacent to the Walnut Creek Greenway and a link from the south side of the property to greenway should constructed. An improved pedestrian crossing at Merrie Road should also be built. The crossing in this area should provide a median for pedestrian refuge.

The residential parcel discussed below is outlined labeled with its current zoning, R-10. By increasing the recommended building height for key parcels along the Avent Ferry Corridor, safer, more connected streets and pedestrian/bicycle networks will be possible.

Official Zoning Map

In general, current zonings are consistent with the community vision; however, specific adjustments to street frontages and building heights are necessary. These recommendations are detailed in the specific site discussions found in the Implementation section of this document.



**Example image of Green, Urban Frontage from Raleigh's Unified Development Ordinance. This type of frontage is recommended for the Avent Ferry Shopping Center, along Avent Ferry Road.

Future Land Use

The Raleigh Future Land Use Map provides general guidance regarding the type and density of development that should be pursued for specific properties. The Map is an official part of the 2030 Comprehensive Plan and guides the City's policy and development decisions, particularly with regard to site planning and rezoning requests. In general, development proposals and rezoning requests consistent with the Future Land Use Map are more easily approved through the regulatory and site permitting processes. The map outlines future land uses, though in many cases the classifications of the Map match existing uses and conditions. Dominant classifications in the Avent Ferry Corridor include institutional, public parks and open space, residential of varying density, and mixed-use centers.

Key features in the corridor include mixed-use classifications at Mission Valley and Avent Ferry Shopping Centers. Mission Valley is classified as a Community Mixed-Use. This classification provides for mid-rise buildings and a wide variety of commercial uses including regional attractors like movie theaters, hotels, and large format grocery, and department stores. Smaller, boutique restaurants, and retail operations are also encouraged.

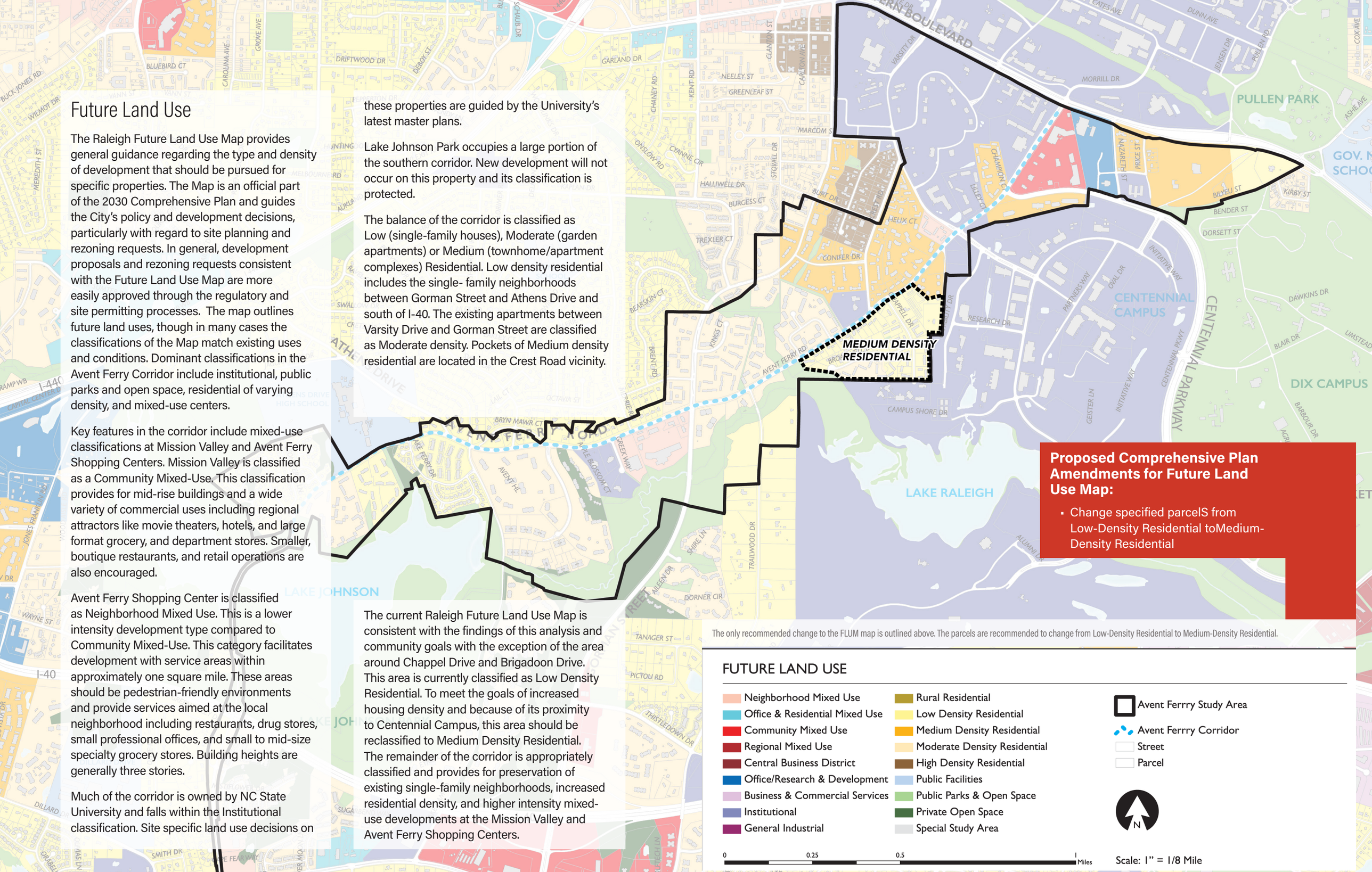
Avent Ferry Shopping Center is classified as Neighborhood Mixed Use. This is a lower intensity development type compared to Community Mixed-Use. This category facilitates development with service areas within approximately one square mile. These areas should be pedestrian-friendly environments and provide services aimed at the local neighborhood including restaurants, drug stores, small professional offices, and small to mid-size specialty grocery stores. Building heights are generally three stories.

Much of the corridor is owned by NC State University and falls within the Institutional classification. Site specific land use decisions on these properties are guided by the University's latest master plans.

Lake Johnson Park occupies a large portion of the southern corridor. New development will not occur on this property and its classification is protected.

The balance of the corridor is classified as Low (single-family houses), Moderate (garden apartments) or Medium (townhome/apartment complexes) Residential. Low density residential includes the single- family neighborhoods between Gorman Street and Athens Drive and south of I-40. The existing apartments between Varsity Drive and Gorman Street are classified as Moderate density. Pockets of Medium density residential are located in the Crest Road vicinity.

The current Raleigh Future Land Use Map is consistent with the findings of this analysis and community goals with the exception of the area around Chappel Drive and Brigadoon Drive. This area is currently classified as Low Density Residential. To meet the goals of increased housing density and because of its proximity to Centennial Campus, this area should be reclassified to Medium Density Residential. The remainder of the corridor is appropriately classified and provides for preservation of existing single-family neighborhoods, increased residential density, and higher intensity mixed-use developments at the Mission Valley and Avent Ferry Shopping Centers.



Proposed Comprehensive Plan Amendments for Future Land Use Map:

- Change specified parcelS from Low-Density Residential toMedium-Density Residential

The only recommended change to the FLUM map is outlined above. The parcels are recommended to change from Low-Density Residential to Medium-Density Residential.

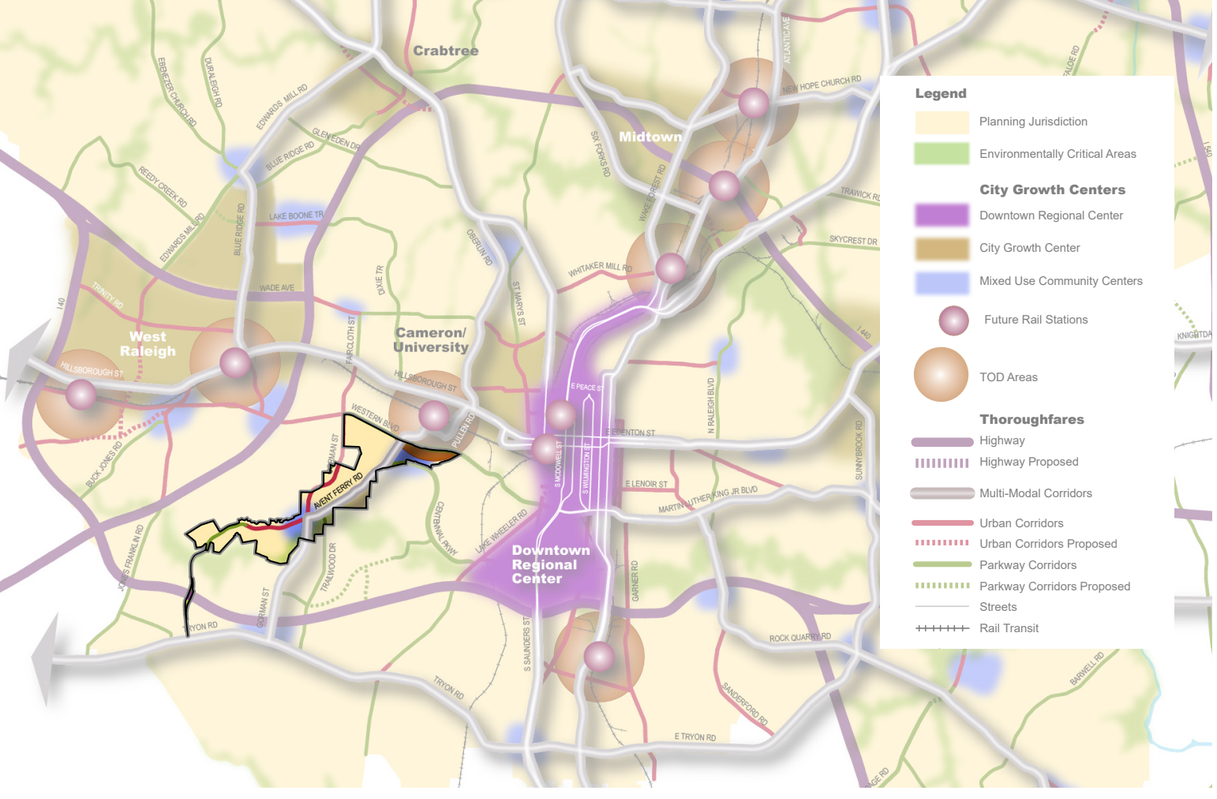
FUTURE LAND USE

- Neighborhood Mixed Use
- Office & Residential Mixed Use
- Community Mixed Use
- Regional Mixed Use
- Central Business District
- Office/Research & Development
- Business & Commercial Services
- Institutional
- General Industrial
- Rural Residential
- Low Density Residential
- Medium Density Residential
- Moderate Density Residential
- High Density Residential
- Public Facilities
- Public Parks & Open Space
- Private Open Space
- Special Study Area
- Avent Ferry Study Area
- Avent Ferry Corridor
- Street
- Parcel

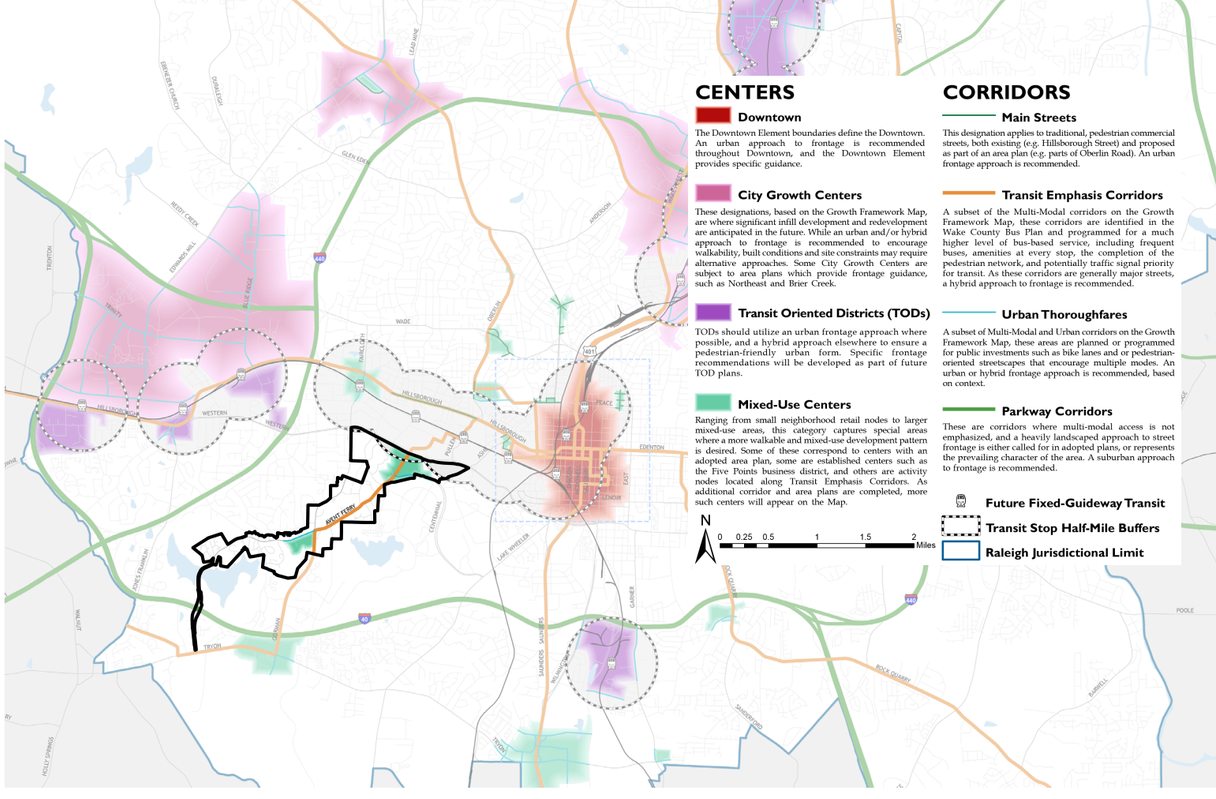
0 0.25 0.5 1 Miles

N

Scale: 1" = 1/8 Mile



The current Growth Framework Map with the Avent Ferry Corridor Study boundary outlined in black. This map aligns with the Study's findings and no changes are recommended.



Current Growth Framework Map with the Avent Ferry Corridor Study boundary outlined in black. The map aligns with the Study's findings, no changes are recommended.

Off-Corridor Improvements

There are several opportunities to improve connectivity between Avent Ferry Road proper and surrounding areas of influence. Those areas include the Fraternity Court, Dix Park, and the Crest Road areas.

NCSU has prepared a master plan for Fraternity Court and Greek Village Drive which includes potential connections to Champion Court and the parking lot for the Avent Ferry Residence Hall. The connection through the parking lot presents an opportunity to provide a comfortable and safe linkage to Mission Valley Shopping Center. The final location of the internal drive to be constructed through the shopping center should align with the Fraternity Court connection. Ultimately, this will create a continuous pedestrian and bicycle corridor from Fraternity Court to Nazareth Street and Dix Park.

Dix Park is undergoing an intensive master planning process which will consider broader connectivity to the surrounding neighborhoods, Centennial Campus, and Downtown Raleigh. As these connections are defined, the Avent Ferry Connectivity Map should be revisited to ensure all possible linkages to the park are developed through greenway, transit, and/or bicycle lanes.

Growth Framework

The Raleigh Growth Framework map is an official part of the Comprehensive Plan and outlines in broad strokes mixed-use community centers, transit routes, and areas appropriate for Transit Oriented Development (TOD). One such TOD is proposed in the area around the Avent Ferry Road and Western Boulevard intersection where a bus rapid transit station is proposed. The map also indicates mixed-use centers at the Mission Valley and Avent Ferry Shopping Centers. The current growth framework map is consistent with community feedback. No changes are proposed.

Urban Form

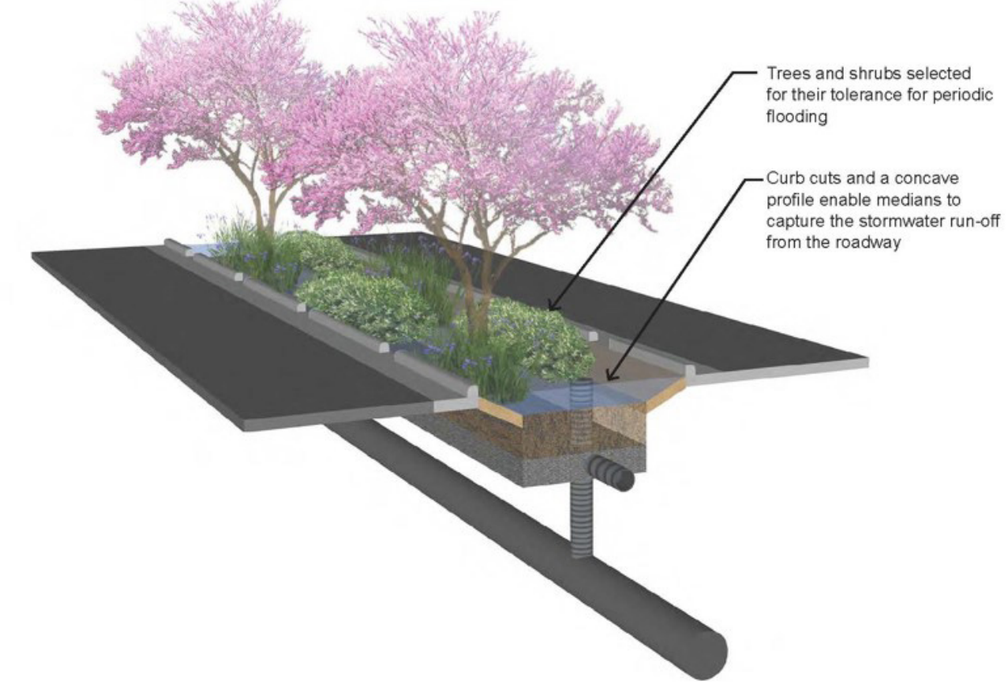
The Urban Form Map indicates locations for corridors of special significance where street frontage should be directly shaped by zoning designations. Avent Ferry Road is classified as a Transit Emphasis Corridor on this map. This type of corridor is programmed for high frequency bus-based services with amenities at each stop, a seamless bicycle and pedestrian network, and supportive hybrid street frontages. The current Urban Form Map is consistent with community feedback and no changes are proposed.

Roadway Stormwater Infrastructure Recommendations

Recommendations for stormwater utilities tailored to these typical sections are:

- Pervious pavement with filtration material for bike paths is recommended. This will allow runoff from the bicycle lane and sidewalk infrastructure to flow through the pavement and be filtered through a mix of aggregates (typically No. 8 aggregate bedding course, No. 57 stone open graded base and No. 2 stone sub-base) specified for maximum infiltration. An overflow drainage system would ensure flooding could be controlled in an extreme weather event.
- A “Green” stormwater gutter system between bike lanes and roadway is recommended. The green gutter would manage stormwater, provides a planted buffer between the roadway and the protected bicycle lane. Curb cuts allow the “green gutter” to collect stormwater from both the roadway and the bicycle and pedestrian facilities.
- A stormwater tree trench, a system of trees connected by an underground infiltration structure, is recommended for the 8’ planted median. While tree trenches are often embedded in paved strips between roadways and sidewalk facilities, a stormwater tree trench would be located within the center median embedded in a green space with other native and adapted vegetation.

The recommended infrastructure improvements will complement the complete streets approach and serve as stormwater management strategy.



An example of stormwater infrastructure that could be incorporated into the 8’ or larger medians along Avent Ferry Rd.

Stormwater Management

Integration of stormwater best management practices in the streetscape can improve water quality, support a variety of vegetation, and contribute to the corridor aesthetic and identity. Green Infrastructure such as biofiltration basins of specially selected vegetation and soils should be integrated into median and the sidewalk zones to capture the first 1 - 1.5” of rainfall wherever possible. This “first flush” of stormwater contains the highest levels of pollutants and debris as it washes off street and sidewalk surfaces. Captured in rain gardens or other stormwater devices, these contaminants can be removed and contained without discharging into the piped stormwater system and ultimately to the Neuse River. Designs should be adjusted for varying filtration, infiltration, and storage capacity while draining any standing water within two days. Overflow drains should connect to the underground stormwater systems for larger rain events.

While variation may occur between the four corridor segments, stormwater treatment, and storage devices should be detailed consistently throughout the corridor. As a high-visibility element, continuity in materials and plant character should contribute to unification of the corridor identity.

An example of geen infrastructure separating pedestrian and/or bicycle facilities from the roadway.
Image source: Landscape Architecture Magazine // Design by: Alta, Russellville, Arkansas

Design Detail Recommendations

Furniture

Established guidelines of street amenity design standards would assist in creating a unified corridor identity while clearly reinforcing the change of character from north to south. Influenced by the character of corridor landmarks, street furnishings should display contemporary design that fits the modern character of Centennial Campus as well as the wooded landscape of Lake Johnson Park. Corridor amenities should include benches, bus shelters, bicycle racks, and trash/recycling receptacles.

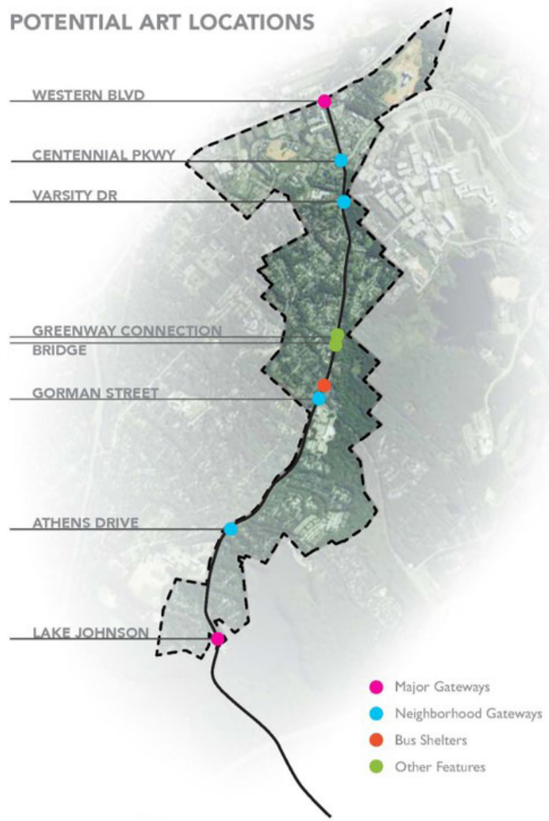
Art

Art in the public space creates iconic elements and memorable spaces that contribute to overall identity in a powerful way. The impacts of public art should be leveraged through strategic placement as well as integration efforts with artists, engineers, urban designers, and landscape architects early in the corridor design process. A close working relationship should result in seamless integration of art into the overall corridor in components such as street furnishings and other freestanding expressive works. Successful integration of art along Avent Ferry is important to the corridor and deserving of early planning and funding commitments.

It is important to integrate art throughout the corridor, emphasizing tactile and interactive installations. Potential high-visibility locations include:

- Corridor gateways
- Roadway intersections
- Capital Area Greenway connections
- Medians
- Transit stops
- Special paving and crosswalks

The style and materials of NCSU's Centennial Campus should help inform the identity of the Avent Ferry Corridor from Western Blvd. to south of Centennial Campus. Hunt Library is pictured here.
Photo source: ArchDaily, Design by: Snøhetta



Materials and Paving

A consistent palette of paving materials and treatments will have a significant impact on the corridor character. Consistent material treatments selected for sidewalks and crosswalks should be used throughout the corridor and extend to pedestrian refuges, bus stops, seating areas, and other streetscape elements. Sidewalks installed by adjacent developers should respond to the approved materials palette to create congruous connections.

A variety of factors should influence material selection including aesthetics, installation cost, longevity, and stormwater permeability.

As Avent Ferry meanders south, it takes on a more naturalistic landscape. Any implementation along this portion of the corridor should mimic this aesthetic. Lake Johnson Boathouse is pictured here. Photo source: Explore Raleigh

DESIGN RECOMMENDATIONS

MATERIAL	COST (PER SQ.FT.)	DURABILITY (YEARS)	SIDEWALK	BIKE LANE	CROSS WALK	MEDIAN/ PEDESTRIAN REFUGES*
Asphalt	$5-$9	4-8	Not Acceptable	Acceptable	Acceptable	Not Acceptable
Heavy Duty Concrete	$6-$9	15-30	**Not Acceptable**	**Preferred**	Acceptable	Acceptable
Concrete Sidewalk	$3.50-$5.50	15-30	**Preferred**	**Not Acceptable**	**Not Acceptable**	**Not Acceptable**
Colored and/ or Stamped Concrete	$15-$20	15-30	**Preferred**	**Preferred**	Acceptable	Acceptable
Stamped Asphalt	$9-$12	4-8	Not Acceptable	Not Acceptable	Acceptable	Not Acceptable
Brick	$10-$16	20-40+	**Preferred**	Acceptable	**Preferred**	Acceptable
Concrete Pavers	$7-$20	20-40	**Preferred**	Acceptable	**Preferred**	**Preferred**
Permeable Pavers	$6-$15	20-40	**Preferred**	Acceptable	Not Acceptable	**Preferred**

*Install where hardened median is required or where bicycle and pedestrian facilities cross median. Otherwise medians should be well landscaped.

Street Lights and Power Poles

Overhead power lines add visual clutter to the corridor and restrict opportunities to plant large shade trees. A long-term goal should be to locate these lines underground. As lines are moved underground, decorative metal light poles should be installed. Pedestrian-scaled lighting should be added during construction of new developments. In lieu of buried power lines, the City should consider relocating poles and consolidating lines in the center island to accommodate street trees along sidewalks.

Signage and Monumentation

Signage is a powerful way to create a common identity throughout the corridor. A comprehensive signage plan should be developed and implemented for the corridor. The signage plan should emphasize the predominant corridor character including ethnic diversity and high-tech research activities. The plans should include a hierarchy of signage types and purposes including:

- Monument/Icon: include bold and iconic installations that speak to the corridor's brand and identity.
- Corridor Directional: direct pedestrians and drivers to destinations and amenities in area such as NCSU, Mission Valley, Dorthea Dix Park, etc.
- Educational: describe GI infrastructure within streetscape
- Neighborhood Gateway - identify mixed use and residential community entrances.
- Greenway – highlight entrances and connectivity to destinations.

Example of signange at the entrance to the Neuse River Greenway.

The development analysis suggests the following strategies to reinforce Avent Ferry Road's development identity:

- Establish consistent landscaping and signage standards
- Define standards for building size, location, and quality
- Integrate repetitive, unique art into the design

Planting

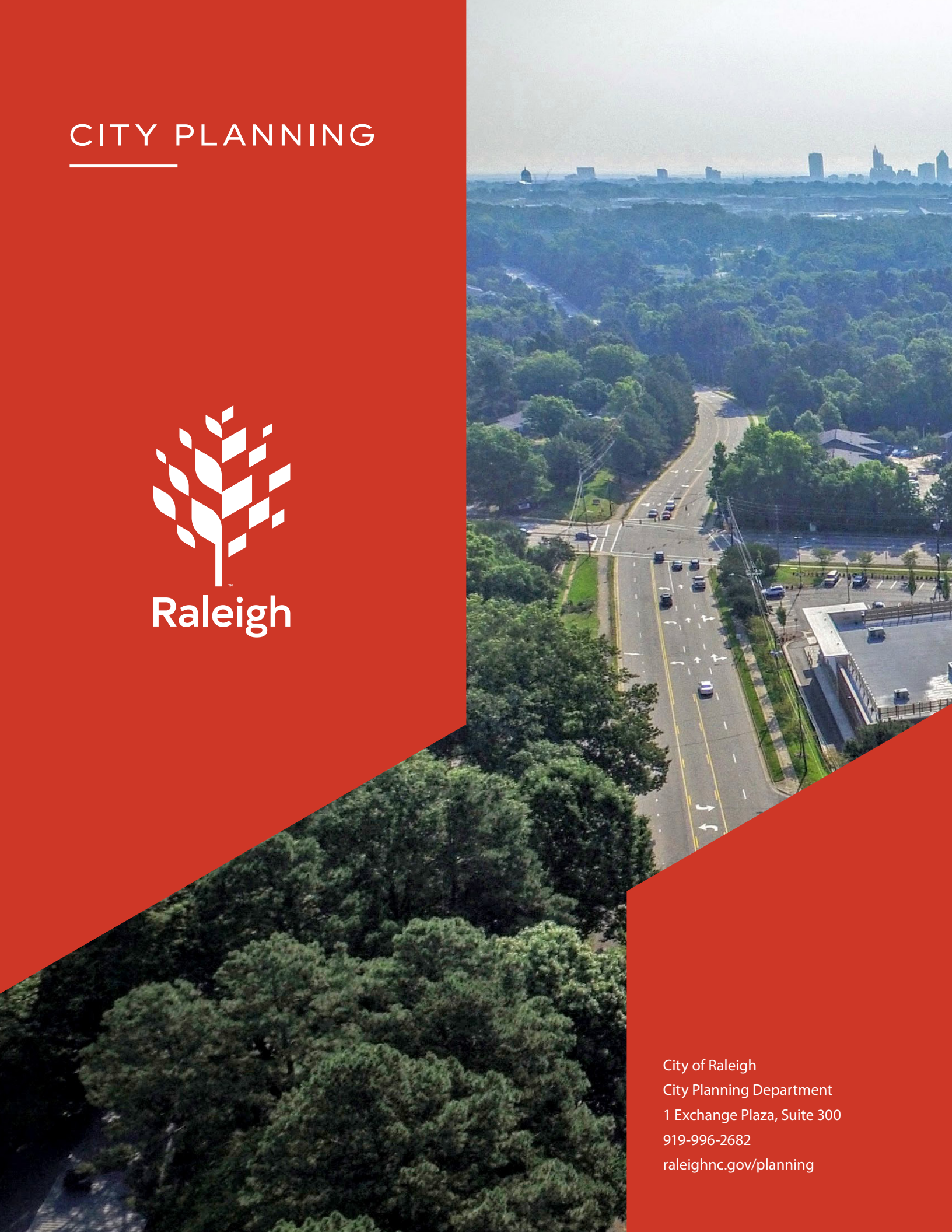
Anchored by NCSU at one end and Lake Johnson Park at the other, the selected plant species reflect the endemic landscape of the North Carolina piedmont. The plant palette should also contribute to the distinctive character of the corridor. A cohesive plant list should be installed throughout the corridor win medians, the sidewalk amenity zone, and development entrances. The proposed Avent Ferry Road corridor plant palette of vertically layered trees, shrubs, and groundcovers should provide year-round interest through variation in plant habit, texture, and color. Additionally, by prioritizing use of native and nectar and pollen rich plant material, the plant schedule should contribute to the creation of sustainable pollinator habitats to support Raleigh's designation as a "Bee City USA" municipality.

Planting along the roadway, bike lanes, and sidewalks should be adequately spaced from the pavement with consideration of mature size to prevent overgrowth into travel lanes visible along the corridor today. Appropriate plant selections and placement can reduce pruning maintenance and contribute to a safer and more enjoyable commute.

For a plant list that includes species for overall trees, shrubs, groundcovers, and bioretention candidates, please see details in the appendix.

CITY PLANNING

Raleigh



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